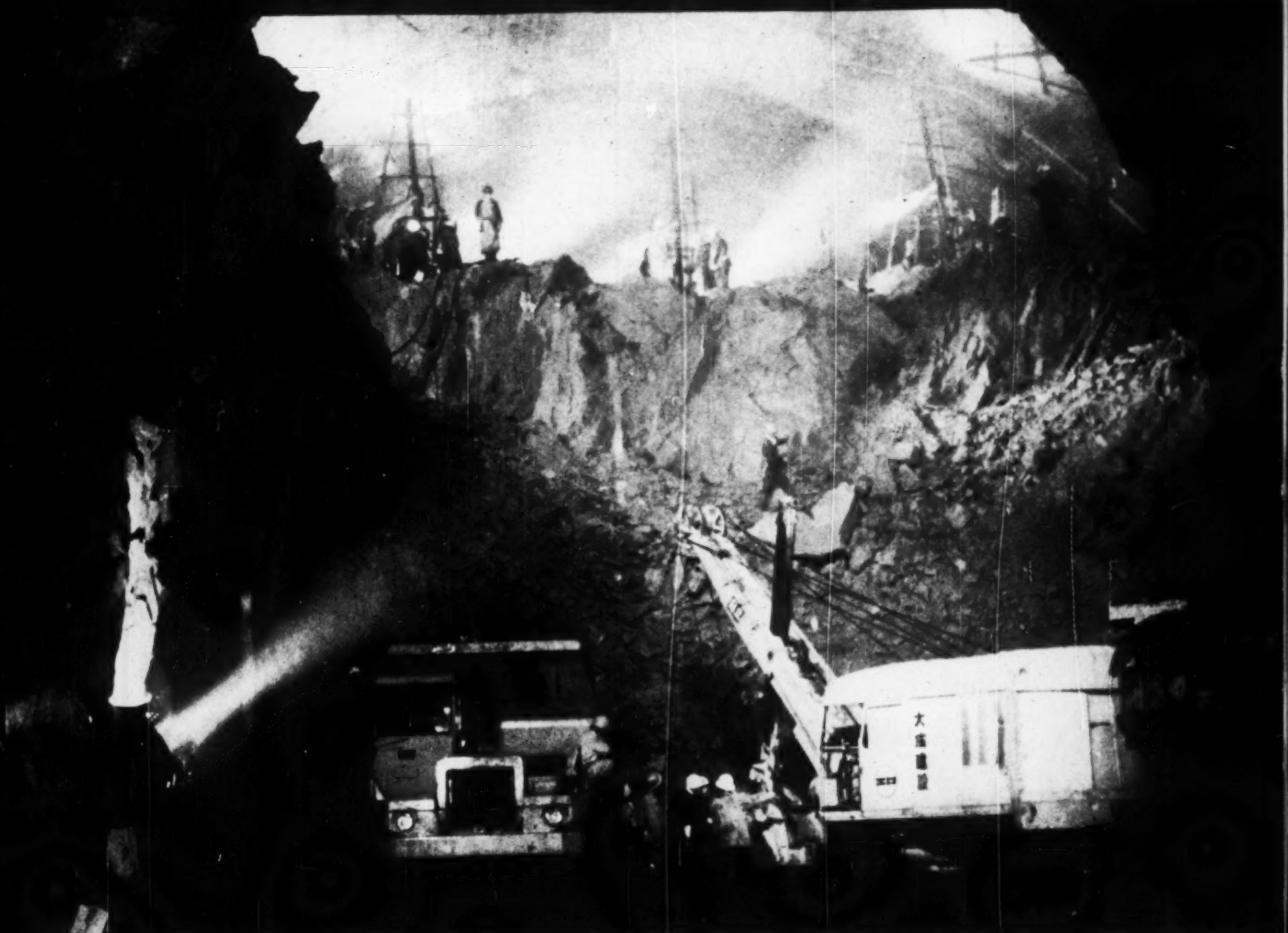
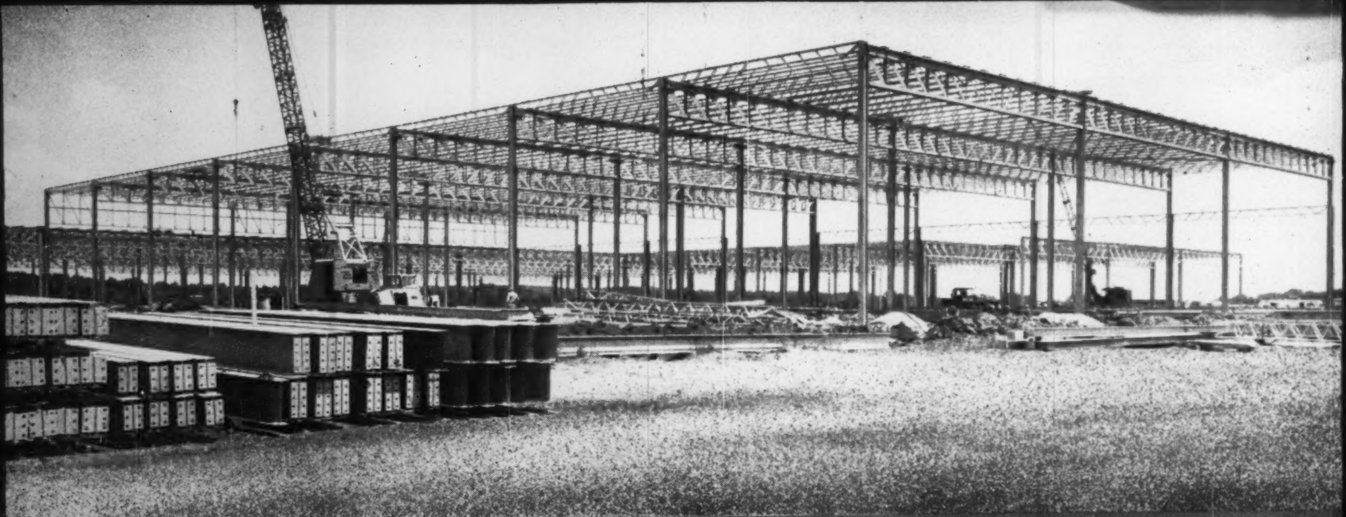
ENGINEERING NEWS-RECORD



Japanese gouge out a powerhouse cavern p.30

A McGRAW-HILL PUBLICATION

STEVENS RICE GS N
UNIV MICROFILMS INC COLL
313 N FIRST ST
ANN ARBOR MICH C 4-5



Meredith Printing Company, Des Moines, Ia.

WHEN IT COMES TO

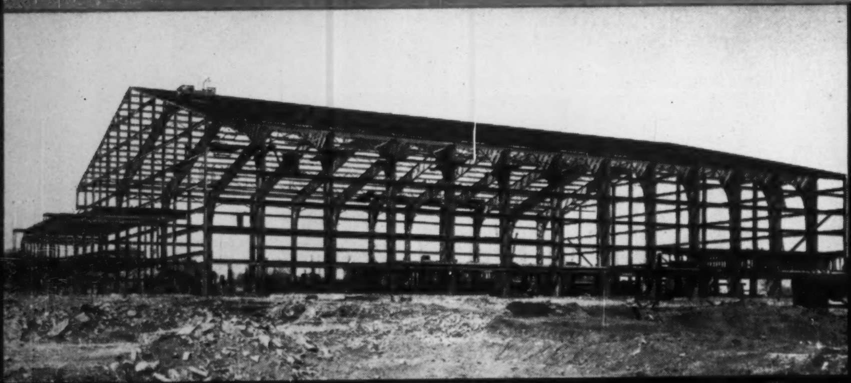
STRUCTURAL STEEL

YOU'LL DO BETTER WHEN YOU COME TO

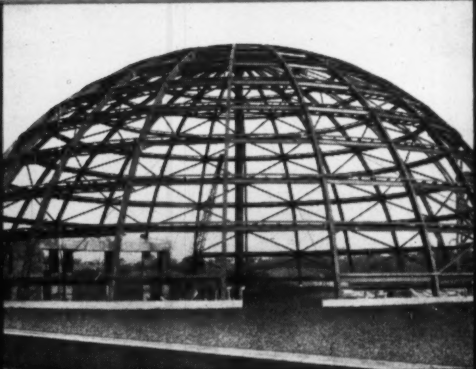
Pittsburgh-Des Moines

Precise shop fabrication and highly-skilled field erection are part of the reasons why. But of equal importance to you are the administrative experience and caliber of supervision that assure smooth operation and on-schedule project completions when PDM handles the job. Six fabricating plants across the country to serve you. Check our nearest office for consultation and quotation, without obligation.

PDM
STEEL COMPANY



Memorial Coliseum, Des Moines, Ia.



Auditorium dome, John J. Kane Hospital, Pittsburgh, Pa.

Field House,
Allegheny College,
Meadville, Pa.

PITTSBURGH-DES MOINES STEEL COMPANY

Plants at PITTSBURGH, WARREN, BRISTOL, PA. • BALTIMORE • BIRMINGHAM • DES MOINES • PROVO, UTAH • CASPER, WYO. • SANTA CLARA, FRESNO, STOCKTON, CALIF.

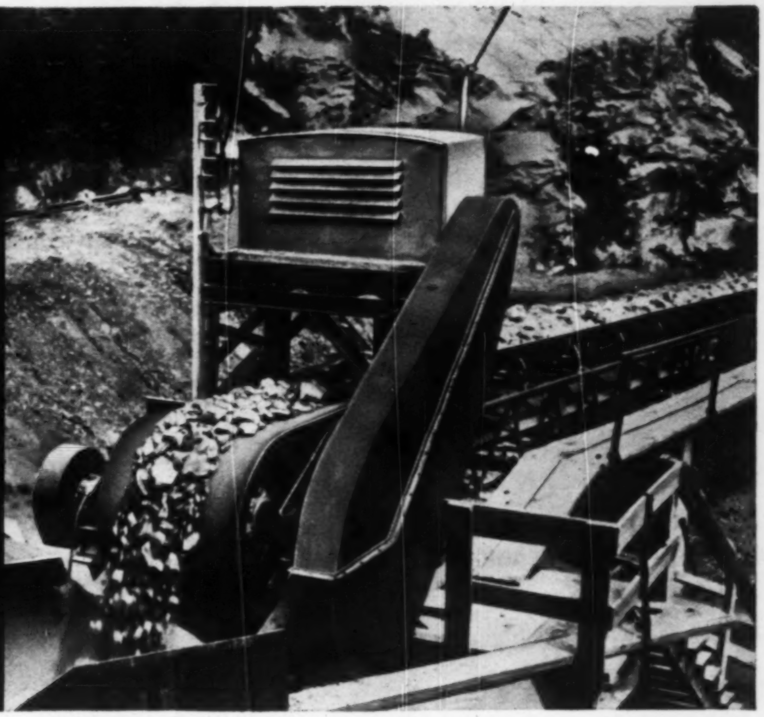
Sales Offices

PITTSBURGH (25)	Neville Island
WARREN, PA.	P. O. Box 660
BALTIMORE (26)	P. O. Box 3459, Curtis Bay Station
BIRMINGHAM (8)	P. O. Box 8641, Ensley Station
DES MOINES (8)	1015 Tuttle Street
PROVO, UTAH	P. O. Box 310
SANTA CLARA, CALIF.	P. O. Box 329
EL MONTE, CALIF.	P. O. Box 2012
NEW YORK (17)	200 East 42nd Street
NEWARK (2)	744 Broad Street
CHICAGO (3)	679 First National Bank Bldg.
ATLANTA (5)	361 East Paces Ferry Rd., N. E.
DALLAS (1)	Suite 1703, Southland Center
DENVER (2)	323 Railway Exchange Bldg.
SEATTLE (1)	500 Wall Street

GOODYEAR

Now...
to remake belting
history..

INDUSTRIAL



...the conveyor belting built for the belt-killers

This is it! New Industrial UNIFLO is the *first* woven-carcass rubber belting specifically designed to make history in hard-rock mining, quarrying, steel mills, pulp mills, foundries and the like.

New Industrial UNIFLO construction is available in a variety of compounds and gauges—including heat- and oil-resistant types. And extensive tests—underground and above-ground alike—have proved its superior capabilities under the toughest operating conditions.

To be specific, UNIFLO construction has . . .

... **proved** its unparalleled resistance to internal rupture caused by trapped material or pulley build-up

... **proved** its tear-resistance 3 times as great as comparable synthetic fabric-reinforced belts—10 times as great as comparable cotton-reinforced belts

... **proved** its excellent impact-resistance

... **proved** its unusually fine cover adhesion and cut-resistance

... **proved** its outstanding troughability and trainability

... **proved** its exceptional edgewear resistance

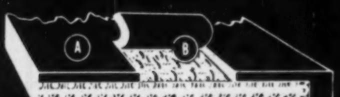
... **proved** its top-rank fastener-retention—handling wet or dry materials

But these are only the highlights of the great new Industrial UNIFLO Belting. For complete details, check with the G.T.M.—Goodyear Technical Man—through your Goodyear Distributor. Or write Goodyear, Industrial Products Division, Akron 16, Ohio.

GOODYEAR INDUSTRIAL PRODUCTS

GTM-Specified

Industrial UNIFLO conveyor belting for severe above-ground service



A Seamless, tough covers in a full range of compounds and thicknesses for superior protection against cuts, abrasion, heat and oil

B Single unit carcass of high-tensile, interwoven yarn bonded to the cover under high pressure to give you exceptional strength and fastener-holding qualities — good troughability and trainability

Lots of good things
come from

INDUSTRIAL PRODUCTS

Uniflo—T.M. The Goodyear Tire & Rubber Company, Akron, Ohio

PROGRESS IN CONCRETE

28 Ft. High, 320 Ft. Diam. Concrete Water Tanks

. . . Erected in 63 Ft. Sections with Symons Steel-Ply Forms

Springfield, Massachusetts doubled its pure water reservoir capacity by addition of the two largest prestressed concrete tanks ever to be constructed in America. The tanks are located on top of Provin Mountain, about 5 miles west of the city.

Diameter of each tank is 320 feet and the walls are 28 feet high. Walls were erected in sixteen sections, with each ganged section being 63 feet wide.

General view of the two big reservoirs. Designed by Bogert and Childs of New York City.

After each pour, Symons Steel-Ply Forms were backed off and swung over to the next section for pouring. Construction was handled by the joint venture firms of Fruin-Colnon Contracting Co., Inc., St. Louis, Mo. and C. & C. Construction Co., Fort Wayne, Indiana.

For the complete story on *America's Two Largest Water Tanks*, just send in your request on your company letterhead. Symons Steel-Ply Forms are rented with purchase option.

Symons®

SYMONS CLAMP & MFG. CO.
4265 Diversey Ave., Dept. M-O, Chicago 39, Ill.
Warehouses Thruout the U.S.A.

MORE **SAVINGS** FROM **SYMONS**

EIGHTY-SIXTH YEAR OF PUBLICATION

ENGINEERING NEWS-RECORD

ABP ABC MEMBER

Editorial Offices, 330 W. 42nd St., New York 36, N. Y.
New York- LOngacre 4-3000; Chicago - MOhawk 4-5800; San Francisco - DOuglas 2-4600
Washington - REpublic 7-6630

Editor, Waldo G. Bowman

Managing Editor, **Arthur J. Fox, Jr.**

Senior Editors, **Frederick S. Merritt, James B. Sullivan, Leo J. Ritter, Jr.**

Transportation—Roads, Railways, Airports, Pipelines, Ports
Leo J. Ritter, Jr., Edward M. Young, Jr., Joseph F. Wilkinson

Buildings—Commercial, Industrial, Housing; Codes, Specifications
Frederick S. Merritt, David B. Hill, Marianne Friedland, C. W. Griffin, Jr.

Water—Sanitation, Water Supply, River Control, Power, Irrigation
James B. Sullivan, William W. Jacobus, Jr., Marie Jensen

Business—Management, Labor, Finance, Markets, Contracts, Economics
Robert J. Stinson, Charles J. Harding

Regional Editors
J. Roland Carr, *Chicago, 520 N. Michigan Ave.*
Martha Alexander, *Staff Assistant*
Lauress L. Wise, *San Francisco, 68 Post St.*
Anne Garcia, *Staff Assistant*

Copy—Production
Irwin Landau, Nancy Parkes, John C. Greenough, Robert M. Echols

Presentation
Harry W. Jensen, Robert G. Young

Statistics, Prices, Costs—Business News
Elsie Eaves, *Manager*
Julia Mahoney, *Construction Reports*
Mildred Wetzel, Marian Sciorra, Marie Moravsik, Eleanor Queret, Francine Todisco, Helene Wahlers
James Webber, Ruth Carlson, *Economics*
William P. Larkin, *Prices, Wages, Indexes*
Evelyn Huber, Edith Ostwald, *Statistics*
D. Arlene Ricker, *Unit Prices*

Editorial Research and Indexing
Eva Gierat, Rene Hay, Jane Jacobson

Consulting Editors: **Van Tuyl Boughton, Nathan A. Bowers**

Advertising Sales Manager: **Donald S. Robertson**

Circulation Manager: **Edward F. Bressler**

Washington Bureau, National Press Bldg., Washington 4, D. C., George B. Bryant, Jr., Chief, Gloria R. Jennings, Alan Adams, Glen Bayless, Roy Calvin, Herbert Cheshire, Anthony DeLeonardis, John Donaldson, Jay Flocken, Boyd France, Clyde Henning, Don Loomis, Daniel McCrary, Gladys Montgomery, Arthur Moore, Burkey Musselman, Seth Payne, Dean Reed, Mort Reichek, Margaret Reid, Caroline Robertson, Thomas Russell, David Secrest, Richard Smith, Vincent Smith.

Domestic News Bureaus: Atlanta—1375 Peachtree St., B. E. Barnes, Chief, Frances Ridgway; **Chicago**—520 N. Michigan Ave., Stewart Ramsey, Chief, Bruce Cross, Sheila Rowe; **Cleveland**—55 Public Square, Arthur Zimmerman, Chief, Violet Forsha; **Dallas**—901 Vaughn Bldg., Marvin Reid, Chief, Lorraine Smith, Mae Brown; **Detroit**—856 Penobscot Bldg., Donald MacDonald, Chief, Sally Ayling, Wesley Perry, Jr.; **Los Angeles**—1125 W. 6th St., Kemp Anderson, Jr., Chief, Carl Havighorst, Michael Murphy, Marvin Petal, Bill Wallace, Mary Williams; **San Francisco**—68 Post St., Jenness Keene, Chief, Donald Winston, Alison Lunt; **Seattle**—6040 Fifth Ave., N.E., Ray Bloomberg.

Foreign News Bureaus: London—John Shinn; **Paris**—Robert Farrell; **Mexico City**—Peter Weaver; **Bonn**—Pete Forbath; **Beirut**—O. M. Marashian; **Tokyo**—Sol Sanders; **Rio de Janeiro**—Leslie Warren; **Caracas**—John Pearson; **Moscow**—Ernest Conine.

Correspondents: In 70 principal U. S. cities and 70 cities throughout the world.

Director of News Bureaus: John Wilhelm; **Managing Editor, Margaret Ralston.**

McGraw-Hill Economics Department: Douglas Greenwald, Manager.

Publisher, Robert F. Boger

ENGINEERING NEWS-RECORD, Vol. 165, No. 23, December 8, 1960

Published weekly by McGraw-Hill Publishing Company, James H. McGraw (1860-1948), Founder. Printed at Albany 1, N. Y. **See panel below for directions regarding subscriptions or change in address. Executive, Editorial, Advertising and Circulation Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.** OFFICERS OF THE PUBLICATIONS DIVISION: Nelson L. Bond, President; Shelton Fisher, Wallace F. Traendly, Senior Vice Presidents; John R. Callaham, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator. OFFICERS OF THE CORPORATION: Donald C. McGraw, President; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, Executive Vice Presidents; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary. **Subscriptions are solicited only from persons with identifiable commercial or professional interests in construction. Position and company connection must be indicated on subscription orders. Publisher reserves the right to refuse unqualified subscription.** United States subscription rate for individuals in the field of this publication $6.00 per year, single copies 50 cents; foreign $20 per year, payable in advance. Second-Class mail postage paid at Albany, New York. Printed in U.S.A. Title registered in U.S. Patent Office.
©Copyright 1960 McGraw-Hill Publishing Co., Inc. All Rights Reserved.
UNCONDITIONAL GUARANTEE: Our primary aim is to provide subscribers with a useful and valuable publication. Your comments and suggestions for improvement are encouraged and will be most welcome. The publisher, upon written request, agrees to refund the part of the subscription price applying to the remaining unfilled portion of the subscription—if editorial service is unsatisfactory.

SUBSCRIPTIONS: Send subscription correspondence and change of address to Fulfillment Manager, ENGINEERING NEWS-RECORD, 330 W. 42nd St., New York 36, N. Y. Subscribers should notify publisher *promptly of any change of address, giving old as well as new address, and including postal zone number,* if any. If possible enclose an address label from a recent issue of the magazine. Please allow one month for change to become effective.

Postmaster: Please send Form 3579 to Fulfillment Manager, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

Handle the "TRICKY" jobs with GREATER EASE!

IT isn't *this* or *that* that gets a crane job done. Your crane problem today is different tomorrow. The machine you need had better not be a one-feature rig.

Here's a bridge job! Four men on the forms! Reinforcing to set and a pour to make! A situation that calls for perfection in operation and smooth response to the operator's need for performance. Northwest Cranes bring you the finest combination of advantages available for the tricky jobs. This operator has smooth, dependable booming guaranteed by the rugged, Independent High Speed Boom Hoist. He can boom up and down continuously under heavy load without over-heating or fading. He has a heavy duty assembly designed for varied crane work.

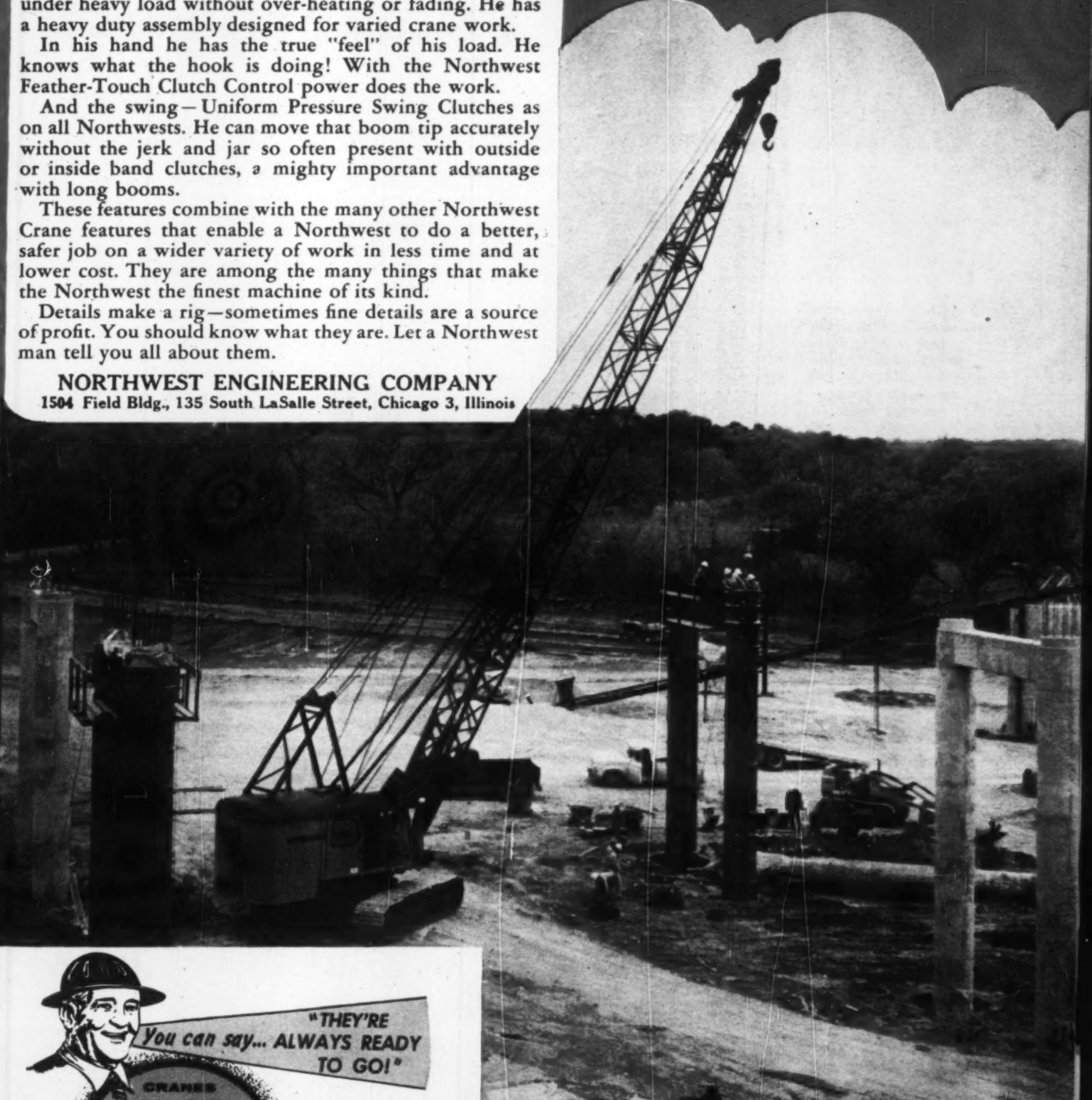
In his hand he has the true "feel" of his load. He knows what the hook is doing! With the Northwest Feather-Touch Clutch Control power does the work.

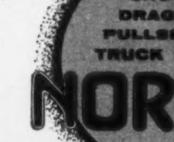
And the swing—Uniform Pressure Swing Clutches as on all Northwests. He can move that boom tip accurately without the jerk and jar so often present with outside or inside band clutches, a mighty important advantage with long booms.

These features combine with the many other Northwest Crane features that enable a Northwest to do a better, safer job on a wider variety of work in less time and at lower cost. They are among the many things that make the Northwest the finest machine of its kind.

Details make a rig—sometimes fine details are a source of profit. You should know what they are. Let a Northwest man tell you all about them.

NORTHWEST ENGINEERING COMPANY
1504 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois





You can say... "THEY'RE ALWAYS READY TO GO!"

CRANES
SHOVELS
DRAGLINES
PULLSHOVELS
TRUCK CRANES

NORTHWEST

3/4 to 3 Cu. Yd. Capacity

THERE'S NO EASIER DRILL TO RUN THAN A REICHdrill!

T-750 truck-mounted REICHdrill. Hole size to 12"; down pressure 45,000 lbs. Other models available, truck or crawler mounted, with hole size to 16 inches, down pressure to 90,000 pounds

This smooth operating, all-hydraulic rotary rig is helping REICHdrillers set higher footage records.

In blast holing, prospecting and coring, there's no easier drill to run than a REICHdrill. And the key to money making drilling records is a simplified *control "console"*. From it, every move required by the driller . . . every decision he makes...is converted smoothly, instantly, by the all-hydraulic system, into positive, time-saving performance.

Hydraulic drive to drill stem eliminates power loss . . . transmission troubles . . . kelly and rotary table.

Vari-speed Hydraulic Drill Control gives the operator the right combination of rotary speed and feed pressure for every formation...leveling jacks, mast raising cylinder and barrel loader are hydraulic too!

Other features: fast, easy set-ups; masts incline for angle drilling; CP heavy-duty compressors; CP Air-Blast Bits for extra footage in toughest formations. *You get more from your rotary when it's a REICHdrill!*

For further information write:

REICHdrill

FRANKLIN (VENANGO COUNTY), PENN.

Division: CHICAGO PNEUMATIC TOOL CO.

Positioned at control "console", REICHdriller has every rig maneuver in sight . . . every rig control in reach.

Don't let anyone kid you:

The laws of chemistry cannot be repealed!

You may hear some talk from the makers of substitute pipes . . . claims that their product is now — somehow — a different product than it was last year — or ten years ago . . . that it is no longer subject to swift, sure chemical destruction by acids and wastes. Don't let anyone kid you. Most substitute pipes are made from chemically active materials. When they are brought into contact with acids, a reaction is bound to occur, because the laws of chemistry cannot be repealed. Vitrified clay pipe, on the other hand, has been specifically designed for use under the severe conditions of sanitary sewers. It has proved itself over and over again. Amvit Jointed Clay Pipe is strong and rigid, can't sag or bend. The plastic joint, like the pipe, is acid resistant. And, roots cannot enter this tight compression joint. Acid-laden, high temperature sewage, discharged from washing machines and garbage disposal units will not bother Amvit Jointed Clay Pipe in any way. Neither will the abrasive action of sand or gravel. For more information on how Amvit can help cut sewer project costs, write or call American Vitrified Products Company, National City Bank Building, Cleveland, Ohio, or our office nearest you.

SINCE 1848

AMERICAN VITRIFIED PRODUCTS COMPANY • CLEVELAND, OHIO

Plants Across the Nation: Brazil, Indiana • Chicago, Illinois • Cleveland, Ohio • Crawfordsville, Indiana • Detroit, Michigan • East Liverpool, Ohio Grand Ledge, Michigan • Lisbon, Ohio • Los Angeles, California • Milwaukee, Wisconsin • Somerville, New Jersey • South Bend, Indiana • St. Louis, Missouri • Whitehall, Illinois

Regional Offices: Cleveland, TO 1-6750 • Chicago, ST 2-5243 • Detroit, GA 1-1940 • Los Angeles, EL 9-4535 • Milwaukee, HO 6-4990 • Somerville, N. J., FO 9-4378 • St. Louis, HA 9-5400

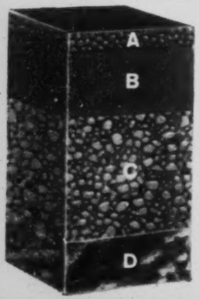
North Carolina Highway Engineers

INTERSTATE
NORTH CAROLINA
85

STAGE CONSTRUCTION IN WIDTH—This new section of N. Carolina's Interstate 85 is a good example of *stage construction in width.* Two new lanes (left), built with DEEP STRENGTH Asphalt pavement, have been constructed alongside existing two lanes of Route 70 (right) to form a new section of this Interstate Highway. This combination of DEEP STRENGTH Asphalt pavement and *stage construction* is helping states to stretch construction dollars and still provide necessary highways quickly.

HERE IS **DEEP STRENGTH**

DESIGN ON I 85

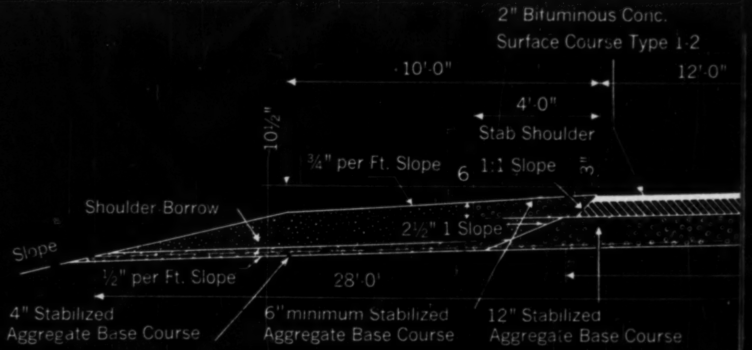


A
2-inch Asphalt concrete surface course

B
6-inch Asphalt concrete base course

C
12-inch Stabilized Aggregate Base Course

D
Subgrade


2" Bituminous Conc.
Surface Course Type 1-2
10'-0"
12'-0"
4'-0"
Stab Shoulder
10½"
¾" per Ft. Slope
6
1:1 Slope
3"
Shoulder Borrow
2½" 1 Slope
Slope
½" per Ft. Slope
28'-0'
4" Stabilized Aggregate Base Course
6" minimum Stabilized Aggregate Base Course
12" Stabilized Aggregate Base Course

SOLVE TROUBLESOME SOIL AND DRAINAGE PROBLEM

Build North Carolina Interstate 85 with new DEEP STRENGTH Asphalt pavement

For new Guilford County section of Interstate No. 85, North Carolina Highway Engineers have chosen DEEP STRENGTH Asphalt pavement.

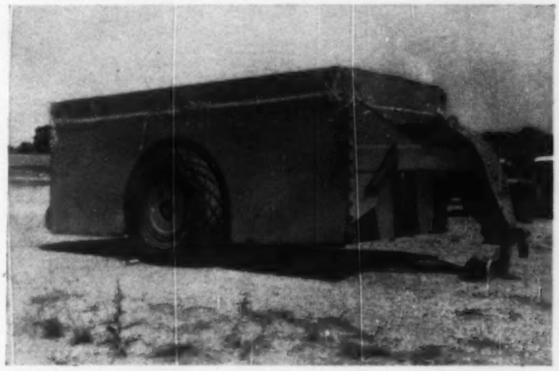
In Guilford County, engineers faced a difficult problem. The native soil in this area contains extensive strata of silty clay with high moisture content which could weaken the support of a finished road. To eliminate this threat to Interstate 85, the foundation was carefully proof-rolled with a 50-ton pneumatic tire roller to locate weak areas. These areas were then strengthened by replacing silty clay with suitable materials or installing necessary sub-drainage. It was only after this painstaking effort that actual construction of the pavement structure was begun.

In building this new part of Interstate 85, N. Carolina engineers followed several precepts of DEEP STRENGTH Asphalt pavement design. Notice in pictures and cross-section (below) the use of **6 inches of Asphalt base under 2 inches of Asphalt concrete surface course . . . Asphalt surface treated outside shoulder . . . depressed median for good drainage . . . heavy proof-rolling of the subgrade . . . and use of high-contact pressure pneumatic tire proof-roller on the aggregate base course.** Here is strength and durability!

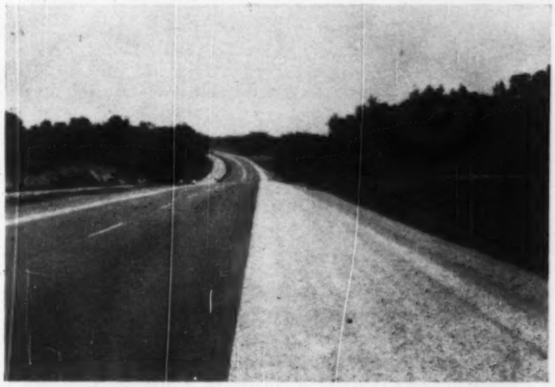
When designed like this—for DEEP STRENGTH—Asphalt pavements *will carry the heaviest traffic loads without distress and with minimum maintenance*. Also, use of Asphalt pavement avoids high repair costs due to damaging action of de-icing salts experienced on other pavement type.

BEST USE OF ROAD FUNDS

State after state is finding that when Interstate Highways are built with Advanced Design DEEP STRENGTH Asphalt pavements, the optimum use is made of road building funds. That's because the Advanced Design Criteria permit inexpensive Asphalt base to be substituted, within limits, for more expensive Asphalt concrete surfacing. In addition, when Asphalt treated base is used in place of untreated base, reduction in total structure thickness may be allowed.



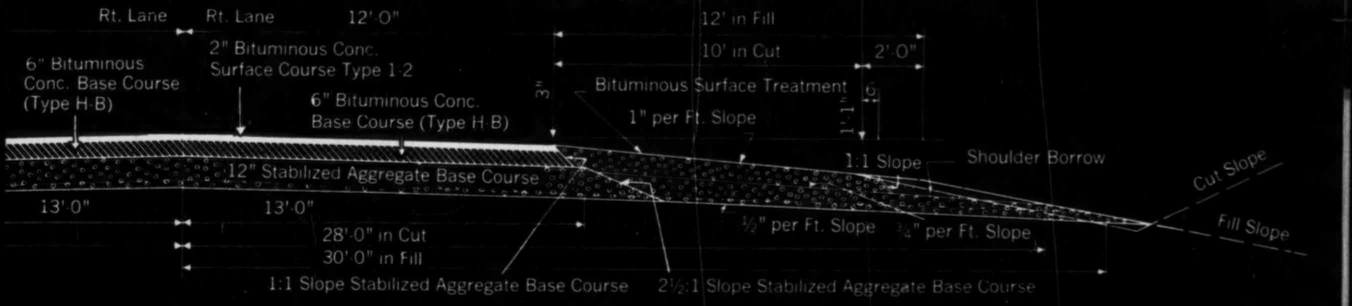
Heavy compaction—This 50-ton rubber tire roller was used to proof-roll the subgrade. The aggregate base was proof-rolled with a 25-ton pneumatic tire roller exerting 82 psi contact pressure.



Outside Shoulders of stabilized aggregate base were Asphalt surface treated for width of 10 ft. One-half inch granite stone chips provide better traffic lane demarcation.

THE ASPHALT INSTITUTE

Asphalt Institute Building, College Park, Maryland


Rt. Lane
Rt. Lane
12'-0"
12' in Fill
10' in Cut
2'-0"
6" Bituminous Conc. Base Course (Type H-B)
2" Bituminous Conc. Surface Course Type 1-2
6" Bituminous Conc. Base Course (Type H-B)
3"
Bituminous Surface Treatment
1" per Ft. Slope
1'-1"
6"
1:1 Slope
Shoulder Borrow
12" Stabilized Aggregate Base Course
Cut Slope
Fill Slope
13'-0"
13'-0"
28'-0" in Cut
30'-0" in Fill
½" per Ft. Slope
¾" per Ft. Slope
1:1 Slope Stabilized Aggregate Base Course
2½:1 Slope Stabilized Aggregate Base Course

Multiple-duty **PAYLOADER**®

...with Side-boom and Bucket

This "PAYLOADER" tractor-shovel, equipped with hydraulic side-boom, is helping to re-lay 1800 ft. of 6-in. gas line two feet deeper to accommodate new street construction. It handles the pipe, backfills and levels off. The same "PAYLOADER" could, in addition, have an hydraulic back-hoe on the rear, and a Drott "4-in-1" clam-shell-type bucket in place of regular bucket on the front.

Usefulness unlimited. These three attachments — side-boom, back-hoe and "4-in-1" bucket — on a single "PAYLOADER", and available only on a "PAYLOADER", give you a one-man equipment fleet for pipe line construction and maintenance. Combined with the traction and mobility of 4-wheel-drive, they can get anywhere quickly and do almost any kind of lifting, trenching, and earth or materials handling work that may be needed.

A size for any need. 4-wheel-drive "PAYLOADER" units are available in 5 sizes up to 12,000 lb. operating capacity. A nearby Hough Distributor with complete service and parts facilities is ready to help select the model and attachments that best fit your needs.

HOUGH®

THE FRANK G. HOUGH CO.
772 SUNNYSIDE AVENUE
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

Send "PAYLOADER" and Attachments literature.

Name
Title
Company
Address
City
State

10-B-6

Reader Comment

Pedestrian Speaks

SIR—We found your recent article, "Interstate Highway Construction Can Make or Break a City" (ENR Sept. 15, p. 26) interesting.

What we found revealing was the contempt some engineers have for public opinion. The statements that only critics come to hearings, that hearings are window dressing, and that departments no longer rely on public hearings, show how well the taxpaying public, those who are relocated or otherwise disrupted, are considered in the vast highway destruction and chaos that is now going on. The statements made to the writer of the article confirm the FORTUNE magazine quotation about highway engineers riding roughshod over local interest.

No matter how noble the intention of highways may seem, we must consider the far-reaching social consequences of what is happening. Engineering done out of social context, without consideration of long-range effects, can do irreparable damage.

LEO WILENSKY
Director
Pedestrian League of America
New York, N. Y.

Watch Those Volts

SIR—I read with much interest the Liberty Mutual Insurance Co. ad (ENR Oct. 27, p. 20) regarding the danger of electric shock on construction jobs.

I have found that the best way to avoid this danger altogether is to use a transformer that drops line load down to 32 volts for lamps and small equipment installed in damp places. On construction where I have been in charge I have never allowed the use of 110 or 220 volts in extension cords.

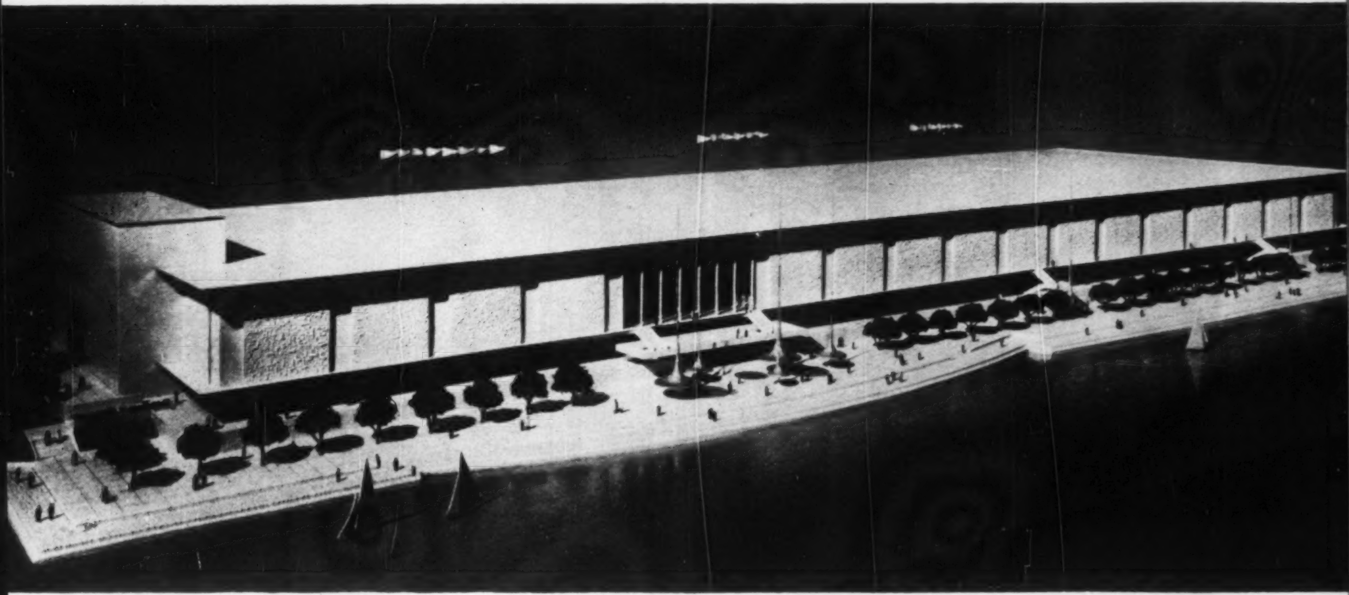
As a further safety feature, the following order should be posted at all switch boxes on a construction job to prevent anyone from accidentally turning on the current while repairs or changes are underway on machines or lines of that circuit:

"Before repair work to this machine or installation is carried out, the switch must be padlocked in the 'off' position and the key kept by the person who does the repairs. Anyone who violates this order will be fired."

CHARLES M. J. KOHLER
Pensacola, Fla.

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

McCormick Place,
Chicago's Fabulous Exhibition Center



–from piling to finished steel in 18 months

The first steel piles for Chicago's $34 million Exposition Center were delivered by United States Steel in October, 1958. Eighteen months later, on March 24, 1960, the last big steel beam was set in place. This gives you an idea of how fast a job moves when it's designed in steel.

This mammoth Exposition Center fulfills a dream of the late Colonel Robert R. McCormick. Three decades ago, he envisioned such a structure on Chicago's lake front. The main building encloses an area larger than six football fields. The height will vary from 40 feet to that of a 10-story building.

USS United States Steel

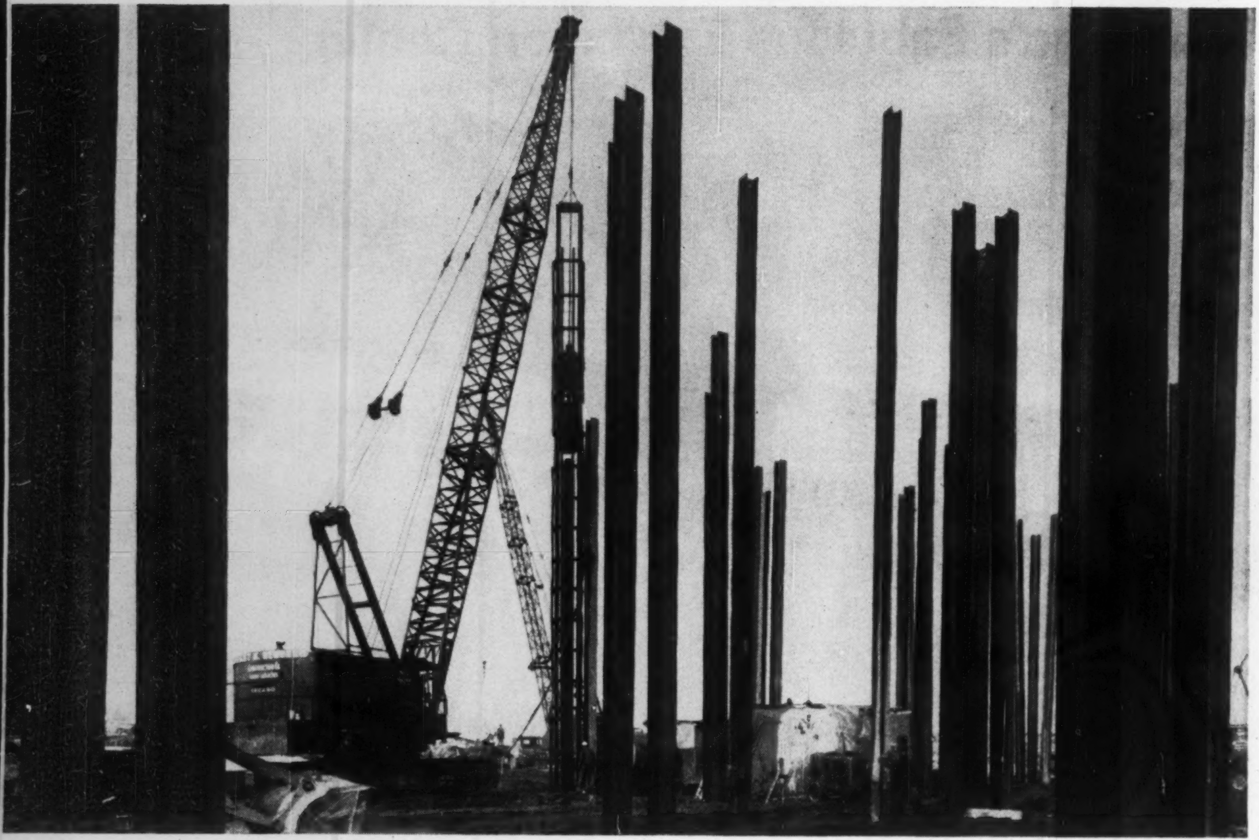
McCormick Place,
Chicago's $34 million
Exposition Center

Chief Architect: Alfred Shaw, Shaw, Metz and Associates. **Consultants:** John Root, Holabird & Root; Victor Hofer of Ralph H. Burke, Inc.; and Edward D. Stone. **General Contractor:** Gust K. Newberg Construction Co. **Structural Fabrication and Erector:** American Bridge Division of United States Steel. **Owner:** Metropolitan Fair and Exposition Authority. **Chairman:** David Mayer, Jr. **General Manager:** Edward J. Lee. **Piling Contractor:** Lake States Engineering Corporation, Chicago.

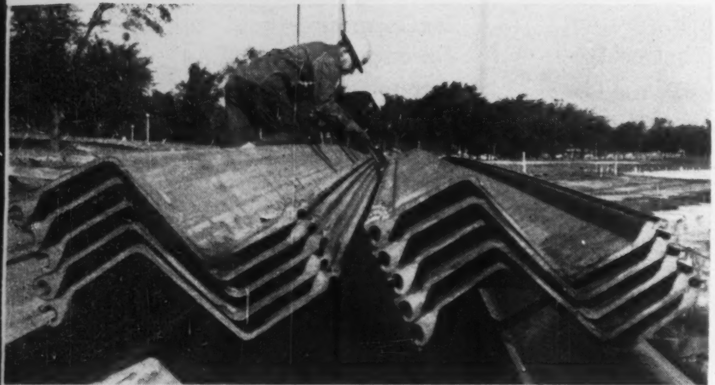
SEE NEXT TWO PAGES ....

Used in McCormick Place...

7,024 tons of USS Steel Piling and



Firm foundation. Clusters of 5 USS H-Piles driven 80 feet deep, capped in concrete to form building column foundations.



USS Steel Sheet Piling delivered to the site in October, 1958, for a bulkhead to straighten the shore line and reclaim valuable land from Lake Michigan.

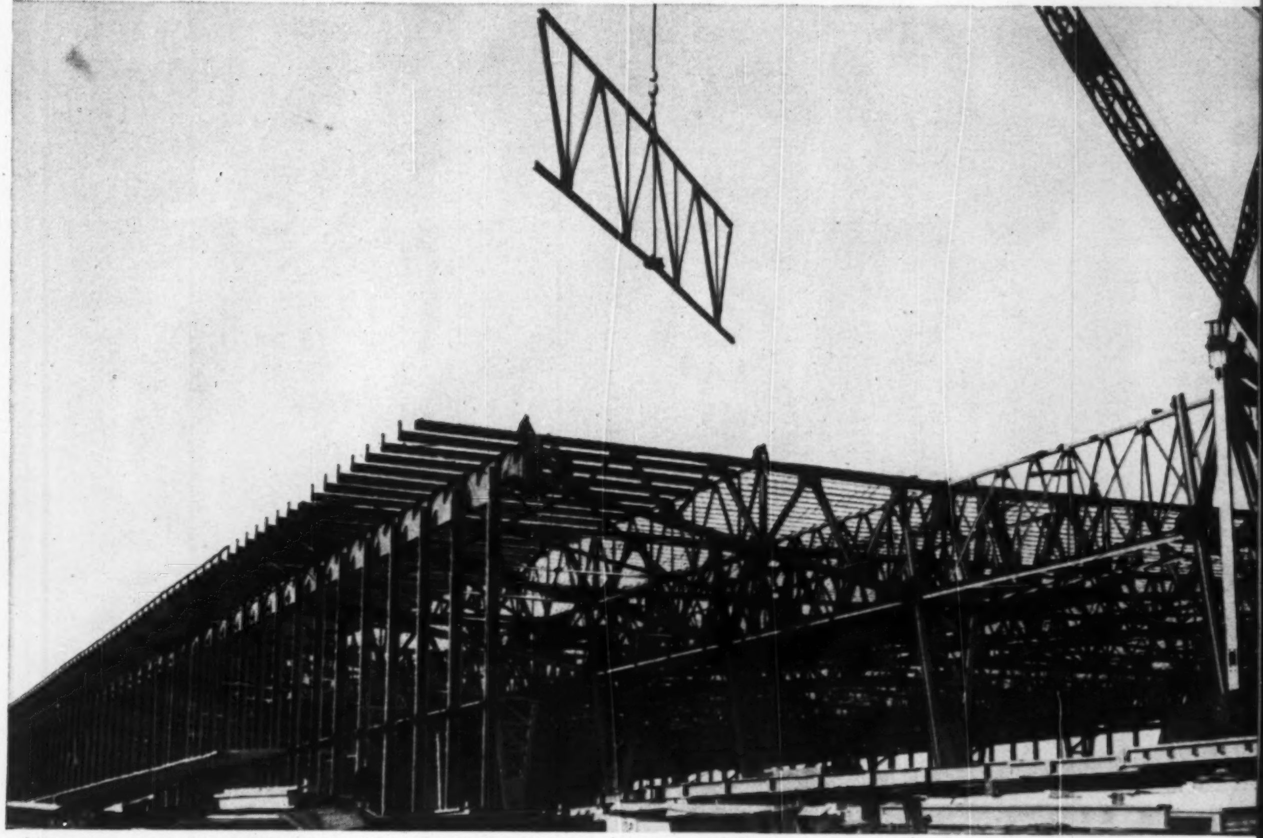
Piling—Before the main building could be started, about five acres of land had to be reclaimed from Lake Michigan. This was done by building a 1,100-foot seawall with steel sheet piling and filling in with more than 100,000 cubic yards of rock, sand and other materials.

The building column foundations consist of 480 clusters of five steel H-Piles each, driven 80 feet deep to bedrock. Altogether, United States Steel furnished 1,073 tons of USS Steel Sheet Piling and 5,951 tons of USS Steel H-Piles for the job. All were delivered on time.

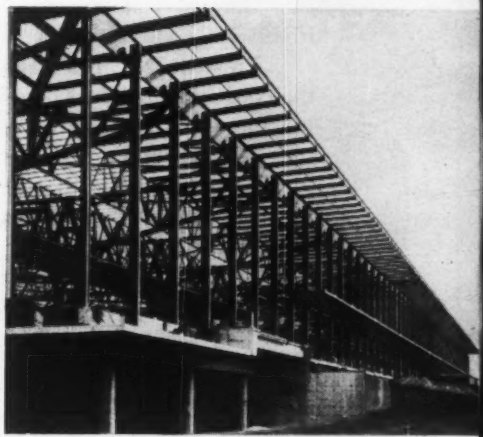
Watch United States Steel's special Christmas show, **The Coming of Christ,** in Color on NBC-TV, Wednesday, December 21, 8:30 P.M., E.S.T.

because it's strong
because it's durable

7,000 tons of USS Structural Steel



Fast erection. Structural Steel for this 1,180′ x 365′ building went up in four months. It contains 300,000 square feet of exhibit space, a 5,000-seat theater, and can handle three conventions at one time.



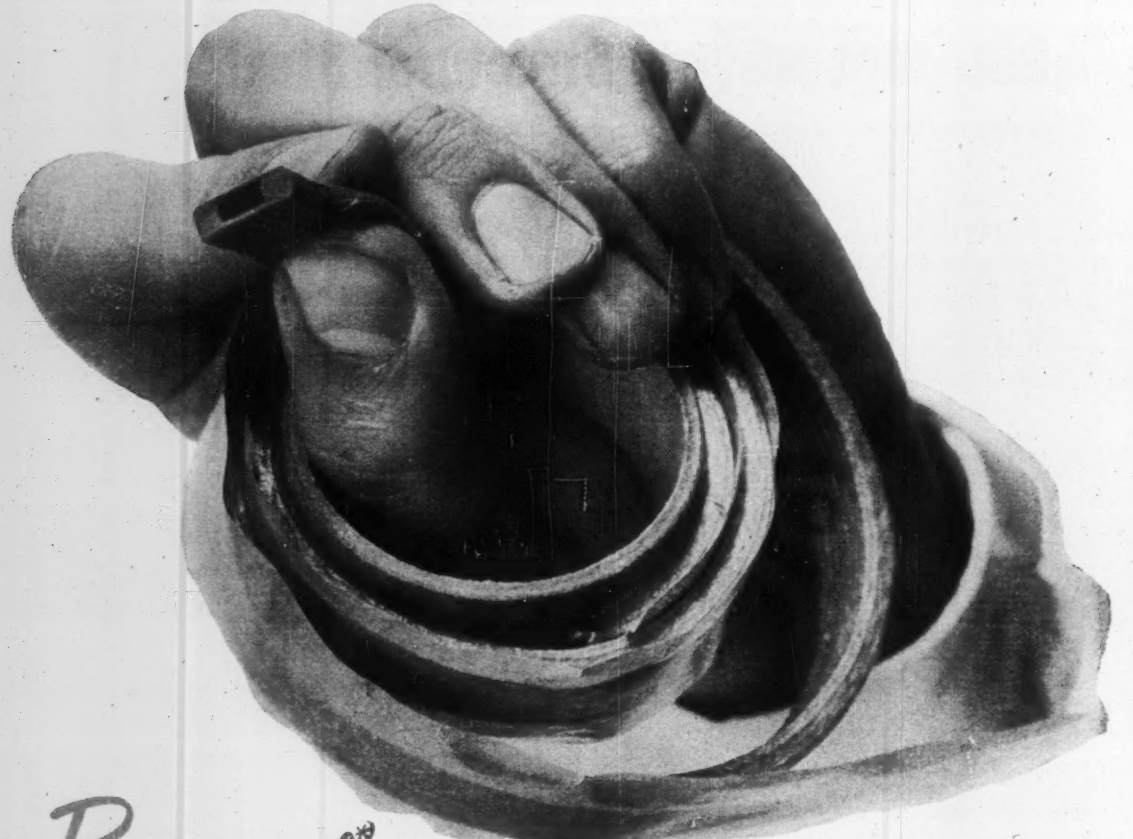
Structural Steel—Once the foundations were in, the structural steel for the huge building went up in four months! Considering the overall size of the structure, 365 x 1,180 feet, this was a tremendous achievement. The average height is about 40 feet, except at the south end which houses a theater section as high as a 10-story building.

The roof of the exhibition hall is carried on 18 cantilever trusses spaced 60 feet apart. Each truss has a 210-foot central span and 65-foot cantilever arms.

Approximately 7,000 tons of structural steel, most of it rolled at United States Steel's South Works in Chicago, were used to make the mammoth frame. The bulk of this steel was fabricated at another U. S. Steel facility in the Chicago area—the Gary, Indiana, plant of American Bridge Division. In addition, thousands of tons of steel were used for reinforcing bars, welded wire fabric and USS Multigrip Floor Plate. McCormick Place is an outstanding example of the growth and progress that is taking place all over America. *USS is a registered trademark*

United States Steel Corporation—Pittsburgh
American Steel & Wire—Cleveland
Columbia-Geneva Steel—San Francisco
National Tube—Pittsburgh
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Export Company

United States Steel



New Pressureseal* 162.3 combines two proven products

1. elastic compound tape for intimate bonding

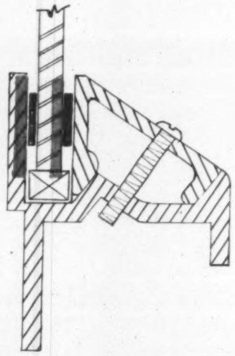
2. neoprene for lasting resiliency

Here at last is double insurance for a positive, lasting seal. New PRESSURESEAL unites . . .

Presstite No. 162 Elastic Compound Tape, already in wide use in the construction field where its excellent plasticity, adhesion and weather resistance are helping to achieve the controlled comfort found in many of today's new skyscrapers, with . . .

Neoprene, PRESSURESEAL's "core", a synthetic rubber well-known for its ability to "give and take" with the contraction and expansion of modern design.

United, these two proven products provide an *elastic bond* to seal . . . and a *resilient cushion* to absorb pressure loads.



WANT A SAMPLE? It's yours on request, along with illustrated literature. Call or write Dept. B-4.

*Patents applied for.

PRESSTITE SEALING COMPOUNDS

PRESSTITE DIVISION
AMERICAN-MARIETTA COMPANY

A-M

A DIVISION OF AMERICAN-MARIETTA COMPANY • 3740 CHOUTEAU AVE. • ST. LOUIS 10, MO.

JOHN DEERE
JOHN DEERE

Now there's more dirt ahead of the blade . . .

more power behind it . . . with the new **TEN-TEN**

There are plenty of good reasons why earthmoving goes fast and easy with the New John Deere TEN-TEN Dozer. First is the all-new four-cylinder John Deere 40-h.p. gasoline or Diesel engine, designed for high efficiency throughout the full throttle range. An optional hydraulic direction reverser with big, wet-disk clutches speeds work cycles, cuts out almost all clutching and shifting.

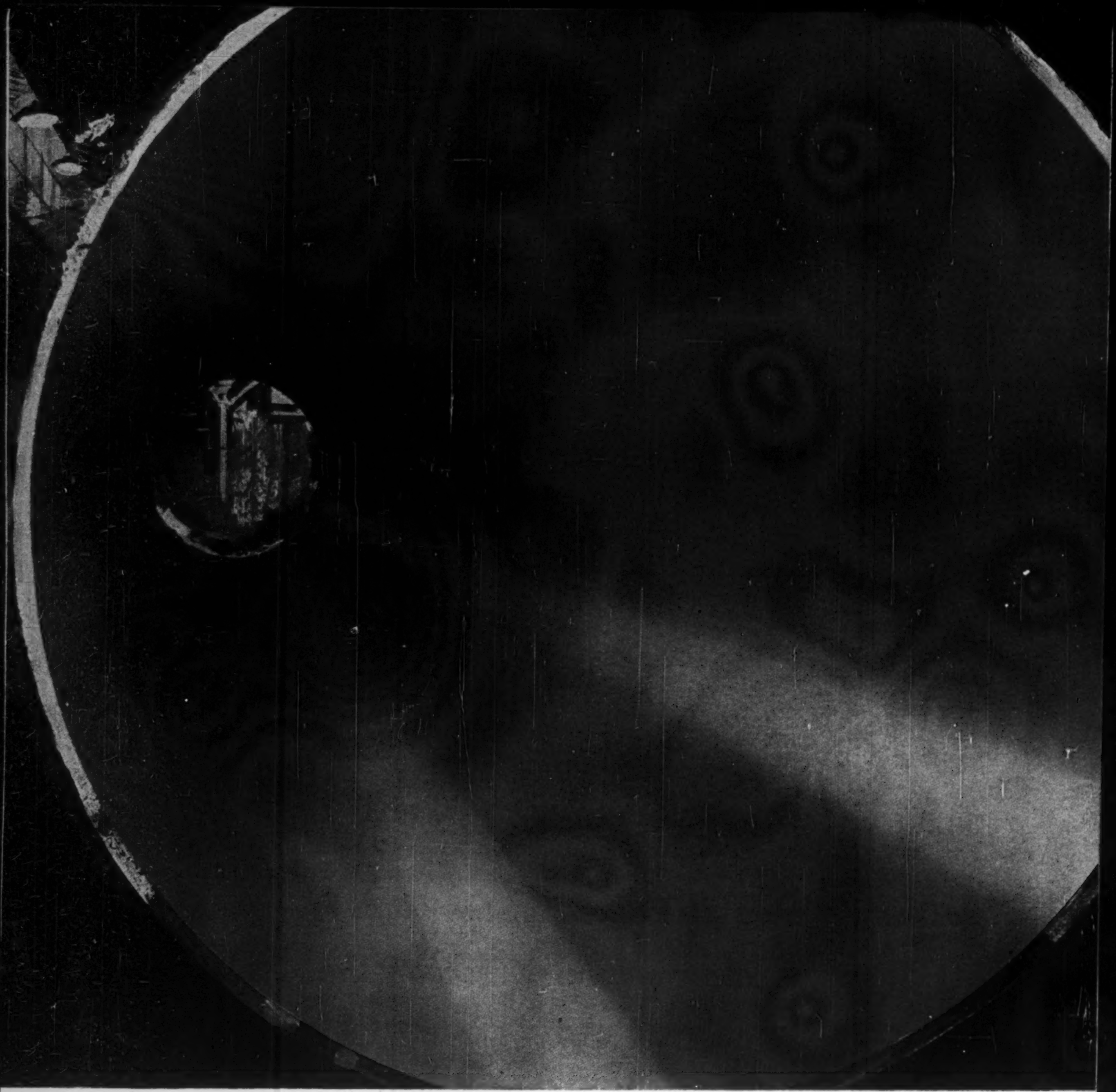
From John Deere's wide equipment line you can select just the blade width and inside or outside mounting you need for top productivity on your particular work. All new cutting edges are of three-piece design with removable end bits for simple, low-cost maintenance. All-hydraulic models now cut, lift, angle, and tilt in fast response to a revolutionary single T-bar control.

Check the yellow pages for the name of your nearest John Deere dealer. He's the man to see for a TEN-TEN demonstration plus facts on the John Deere Credit Plan and information on new long-term leasing arrangements now available.

JOHN DEERE • 3300 RIVER DRIVE • MOLINE • ILLINOIS

JOHN DEERE

LOADERS
BULLDOZERS
BACKHOES
AND
EARTHMOVING
EQUIPMENT

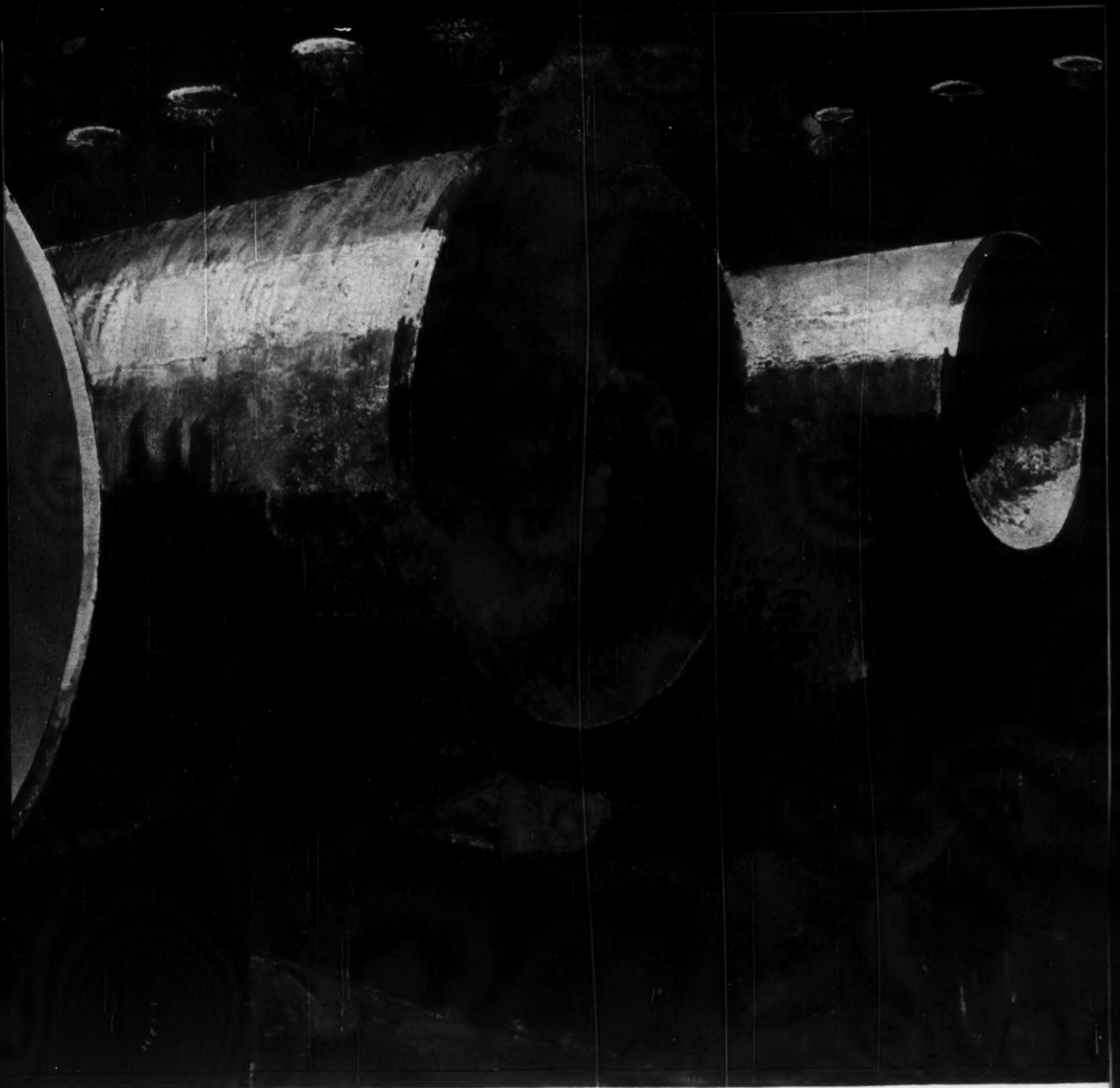


Now USS National Electric Weld line pipe can be internally coated right at the plant

National Tube has erected new buildings and equipment at the Orange, Texas, and McKeesport, Pennsylvania, plants. Your contractor can use these facilities to apply internal epoxy coating for increased flow efficiency and easier cleaning of line pipe.

The coating facilities are all *under roof* to eliminate

This mark tells you a product is made of modern, dependable Steel



weather hazards. No corrosion, water, or dust to complicate coating operations. You get a uniform, high quality internal coating job. We invite you and your coating contractor to visit our plants and see how these facilities can help you. Or write to National Tube, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS and National are registered trademarks

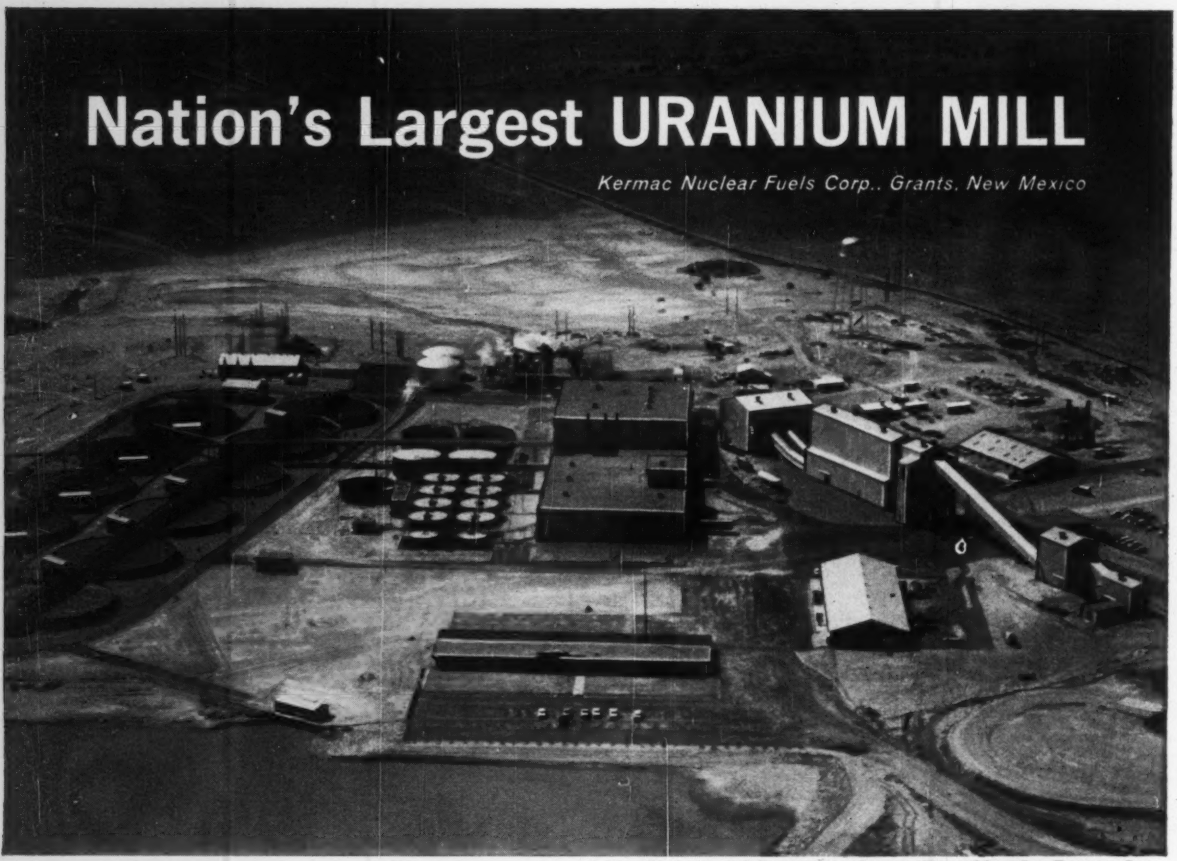
USS

National Tube
Division of
United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
United States Steel Export Company, New York

Watch United States Steel's special Christmas show, **The Coming of Christ,** in Color on NBC-TV, Wednesday, December 21, 8:30 P.M., E.S.T.

Nation's Largest URANIUM MILL



Kermac Nuclear Fuels Corp., Grants, New Mexico

Engineers and Constructors: STEARNS-ROGER MFG. CO., DENVER, COLO.

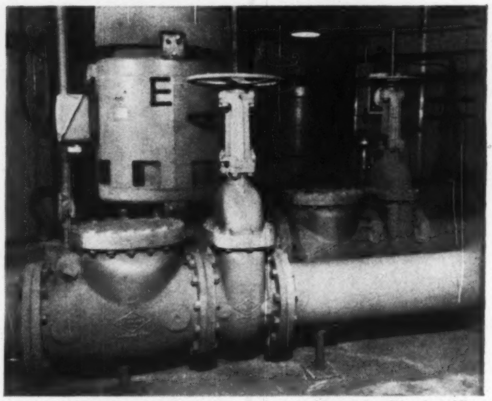
Here, uninterrupted functioning of valves is vital to continuous operation ...so JENKINS VALVES were chosen

This $18,000,000 mill, built in 1958, produces uranium oxide, called yellowcake, from raw uranium ore. Four to five pounds of yellowcake are obtained from a ton of ore by an acid leach, solvent extraction process perfected by Kerr-McGee Oil Industries, Inc. The product is sold under contract to the Atomic Energy Commission.

In the processing, ore and its many derivative components are put through so many washing operations that the mill might be termed the world's biggest "laundry". The valves controlling the use of plant process water are in continuous service.

The chance of valve trouble must be minimized here. It was accomplished by installing JENKINS valves . . . chosen on their record of dependable, long-life performance in critical services for almost a century.

YOU PAY NO MORE when you demand these famous valves for your jobs. And, you gain substantial savings through reduced maintenance and replacement of valves. Jenkins Bros. 100 Park Avenue, New York 17.



Jenkins Valves control process water to the rod mill, classifier sections and the acid plant. Also, lines in power house and heating system.

JENKINS

LOOK FOR THE JENKINS DIAMOND

VALVES

JENKINS SINCE 1864

Jenkins Bros

Sold Through Leading Distributors Everywhere

ENGINEERING NEWS-RECORD

Vol. 165, No. 23 December 8, 1960

Number of copies printed in this issue 86,759

CONTENTS

U. S. Control Worries Road Men 21
After 17 Million Miles, Road Test Ends 22
Twin Cities Get $100-Million Plan 23
Water Tunnel Must Beat Bridge 23
Six Steps to Produce a House for $1,000 24
Rolling Scaffolds Form Domed Roof for Coliseum 26
Folded Plates Roof Round Bank 28

FEATURES

Japanese Dambuilding Is a Flourishing Art 30
Loads Get Hefty As Banking Goes Mechanical .. 42
Job-Built Rig Places Big Beams 47
'Missile Mauler' Tests the Polaris 53

FIELD AND OFFICE

Big Derrick Places Trusses 56

NEW PRODUCTS

Smith Enters Asphalt Field 59

MEN AND JOBS

High Corps Post Changes Hands 64

BUSINESS AND FINANCE

Cities Confident of Federal-Aid Increase 78
Bids Due on $11.5-Million Building 79
Contract Awards Now Top '59 by 14% 83
Costs Up Slightly This Month 83
Union Funds to Finance Homebuilding 84
Equipment Orders Expected to Drop 84

LABOR

Unions Study 'No Strike' Pledge on Missile Work 86
Canaveral Back in Business—For Now 86
Situs Bill Pushed 87
Steel's Labor Problems Still Unsolved 88

Reader Comment ... 8
Washington Observer 19
Unit Prices 66
Materials Prices ... 67
Construction Reports. 70
Statistics, Indexes ... 75
Editorial 100

Picture Credits

22—ENR; 42, 43—Moulin Studios; 47—Kriss and McCallum; 64 left —U. S. Army; right—U. S. I. A.—U. S. O. M.; 79—Davis Studio.

Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Semiannual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

WHY IT FAILED—Bearing failures at the beam-column connections caused the building collapse that killed five workmen in Harrisonburg, Va., last month (ENR Dec. 1, p. 30). That's the conclusion of three investigating consultants hired by Concrete Structures, Inc., fabricators and erectors of the prestressed concrete framing. Six laboratory load tests form the basis of the conclusion. Meanwhile, another team of experts engaged by the owner and architect is investigating the collapse.

IF IT WAS GOOD ENOUGH IN '39 . . .—When a design board of big-name architects handed in preliminary plans for the New York World's Fair, the members were thanked, the group disbanded—and the plans discarded. Instead of the various new looks offered by the architects, Fair president Robert Moses favors a plan based on utilities, roads and services left over from the 1939 World's Fair. The board included Wallace K. Harrison, Edward D. Stone, Henry Dreyfuss, Gordon Bunshaft and Emil H. Praeger.

35 PRESTRESSED STORIES—A 35-story office building to go up in Los Angeles next year may be of prestressed concrete. If so, it will be a record—nearest contender is a 24-story building in Hawaii (ENR Oct. 6, p. 34). T. Y. Lin Associates are working out a design to meet seismic requirements. Lin reports prestressed concrete would save 5 lb of steel per sq ft—a $600,000 saving in the $20-million structure.

LONG STRIKE ENDS—Acceptance of a three-year, 75-cent wage offer ended an 18-week strike of elevator constructors in New York City this week. Separate agreements were reached with the manufacturers and with building contractors and investing builders. Settlement of a conflict over prefabrication was held in abeyance pending renegotiation of the union's national agreement in 1962.

VOLPE STEPS DOWN—AND UP—John a Volpe, governor-elect of Massachusetts, resigns as president of Associated General Contractors of America, effective the end of this month. AGC vice president M. Clare Miller, the nominee for president in '61, will finish out Mr. Volpe's term, which runs to the end of February.

POLITICAL PROBLEM—The American Road Builders Association usually alternates contractors, private engineers and state road engineers in the presidency. A state engineer is due in '61 and Ralph R. Bartelsmeyer, chief engineer of the Illinois Division of Highways, is the nominee. The problem: Mr. Bartelsmeyer may be out of government service when a new state administration takes over next month. Odds are he'll get the ARBA job anyway. He is a past-president of the American Association of State Highway Officials.

operation
time
saver...

GRIFFIN Solves Another Dewatering Problem! To build 11 double piers for the Chicago-to-St. Paul Expressway Bridge over the fast-flowing Wisconsin River, contractor procedure called for constructing three earth cofferdams in the coarse sand, gravel and boulders of the river . . . Typical of construction speed was the progress made in only 10 weeks in the cofferdam shown above: • Construct cofferdam—2 weeks • Install Wellpoint system and dewater to grade—one week • Excavate, drive piles and pour concrete up to river level—7 weeks.

Further proof of time and money saving advantages of Griffin Wellpoint planning, supervision and equipment.

RENTAL / CONTRACT / SALES **GRIFFIN**

GRIFFIN WELLPOINT CORPORATION · GENERAL OFFICE: 881 E. 141st St., New York 54, N.Y.

Branches: Hammond, Ind. • Jacksonville, Fla. • New York, N.Y. • Houston, Tex.
Redwing, Minn. • W. Palm Beach, Fla. • Norfolk, Va. • Gulfport, Miss.

WASHINGTON OBSERVER

Cabinet selections point to:

- **More construction spending**
- **But no budget busting**

- **The Kennedy Cabinet begins to shape up.** It is a "moderate liberal" group which will work toward vigorous federal programs without busting the budget.

David E. Bell, 41, the new Budget Director, believes the bureau should play a stronger role in coordinating the President's policies among the different departments, knocking heads together and insisting on priorities.

He sees public construction as a priority item. Mr. Bell is no bookkeeper. He is an economist, now chief administrative officer of the Harvard School of Public Administration. Associates say he is sensitive to social welfare needs and keen on economic development of underdeveloped areas, particularly long-term capital development, such as roads, dams, power and harbors.

It is significant that President-elect Kennedy reached outside the political arena for this job. Mr. Bell had no part in the campaign; Senator Kennedy knew him only casually. He is an experienced government servant, having been in the Budget Bureau and on the White House staff under President Truman.

Gov. Luther Hodges as Secretary of Commerce, sits well with private industry. His major accomplishment as governor of North Carolina was in recruiting new industry to the state. He believes strongly that the government should provide full incentive for expansion of the economy by giving business as free a hand as possible.

As Health-Education-Welfare Secretary, Gov. Abraham Ribicoff of Connecticut will back strong federal grant-in-aid programs for construction of schools, sewage treatment plants, hospitals. As governor he was impressed with the difficulty of seeking more big capital at the local and state levels, already pushed to their financial limits by postwar population explosions into the suburbs.

He will certainly back the federal aid to school construction program narrowly defeated last year. Indications are he will support congressional Democrats seeking to double sewage construction money. But as governor he kept a tight rein on the budget, was by no means a big spender.

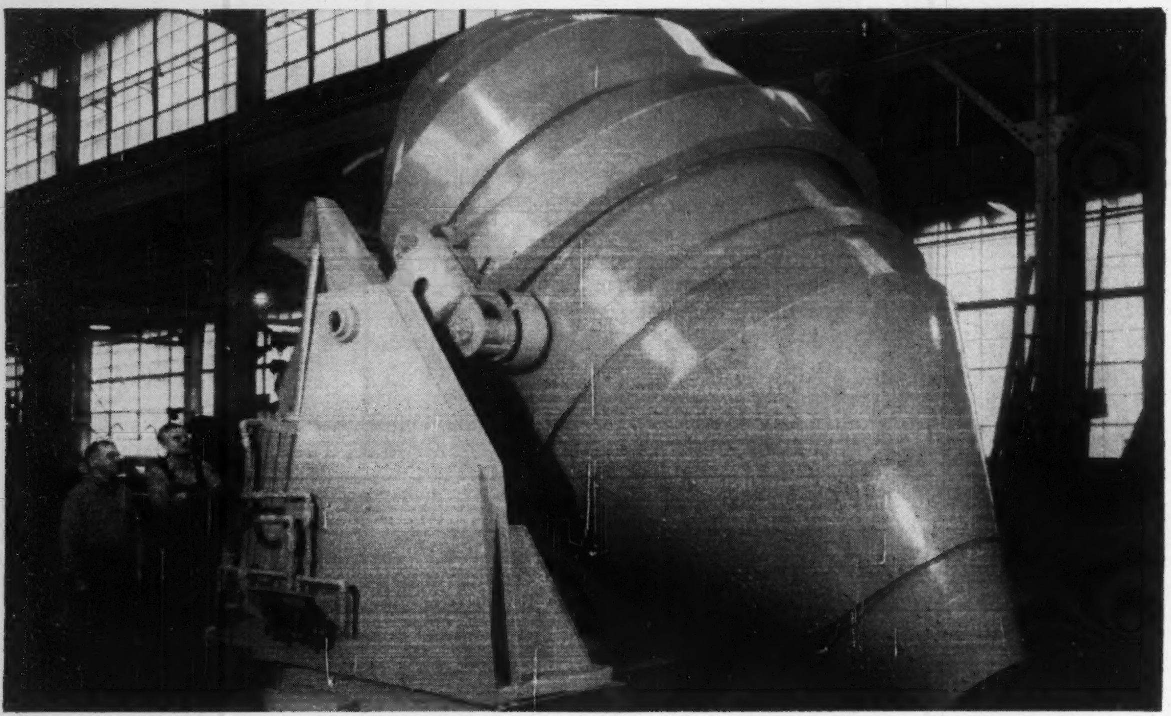
Capital development in Africa will be backed by Gov. G. Mennen Williams as Assistant Secretary for African Affairs. Whatever African aid is proffered will probably mean long-term construction.

Depressed areas loom big in the Kennedy scheme of things. The new committee to come up with plans for stimulating new business in the chronically depressed areas is steered by a Kennedy man, Myer Feldman. So what it reports will be a signal of what the new President wants to do.

—

- **Congressional investigators began putting on their record this week details of the Florida highway scandals** which had, for the most part, been made public by Florida state investigators (ENR Dec. 1, p. 35). Before the hearings end, the Blatnik committee expects to dig into disposal of valuable property on right-of-way—which staff aids say will develop information not fully covered by the Florida investigators.

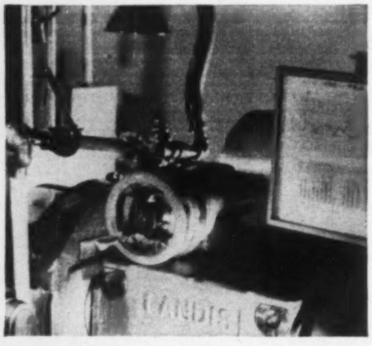
World's largest tilting mixer uses TIMKEN® bearings to triple life



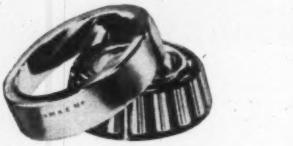
With its 10-cu-yd capacity and weighing 56,000 lbs., this T. L. Smith tilting mixer is the world's largest. By using Timken® tapered roller bearings in the transmission, main rollers and edge rollers, T. L. Smith engineers increased this giant's life to three times that of older, smaller capacity units.

Construction equipment builders have relied upon Timken bearings for more than 40 years because: 1) The tapered design of Timken bearings enables them to take radial and thrust loads in *any* combination. They take shock loads, too. 2) By holding shafts concentric with housings, Timken bearings make closures more effective—keeping lubricant in, dirt out, maintenance down.

EXTRA ENGINEERING SERVICE that saves you time and money. Our graduate engineer salesmen can often solve your bearing problems on the spot.



STATISTICAL QUALITY CONTROL catches "mistakes" before they happen. Charts on our production machines guard against any off-size bearing parts.



Industry rolls on

TIMKEN®

tapered roller bearings

The Timken Roller Bearing Company, Canton 6, Ohio. Cable: "TIMROSCO". Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits. Canadian Division: Canadian Timken, St. Thomas, Ontario.

U.S. Control Worries Road Men

- **AASHO fears the scandals uncovered by the Blatnik committee may eventually lead to greater federal control of highway building.**
- **Organization takes a tentative step into the field of contract management with publication of a project procedures guide.**
- **Armstrong says there's nothing to fear from contract controls—provided engineer and contractor stay within the specs.**

The nation's state highway officials are outwardly nonchalant to the criticism congressional hearings have heaped on the federal-aid road program, but they're moving to improve its administration.

The more than 2,000 highway administrators and engineers gathered in Detroit last week for the 46th annual meeting of the American Association of State Highway Officials coupled a quiet pride in highway construction progress with a growing sense of concern with the emerging role of the federal government in the highway program. And as an answer to demands for even greater federal control they took positive steps to improve contract management at the state level.

On the credit side, Bertram D. Tallamy, outgoing Federal Highway Administrator, spelled out the accomplishments and scale of the expanded highway program to date in these terms:

- Nearly one-quarter of the 41,000-mile Interstate system is now in use.
- Construction contracts were completed on 106,000 miles of ABC roads since 1956.
- Payment of federal funds to the states in the last 4½ years was in excess of federal-aid highway payments in the preceding 40 years.
- Use of modern methods and equipment has overcome initial shortages of engineers and materials.
- Highway research has been productive.
- Highway construction has stimulated industry, business, housing, and recreation; has increased land values.

Mr. Tallamy, who shortly will submit his resignation from the country's top highway post, has directed the preparation of the new cost estimate for completion of the Interstate system, which is due to be submitted to Congress next month (ENR Aug. 25, p. 23). "The new cost estimate will not differ materially from that submitted in 1958, and I can tell you at this time it will not be greater," he told the AASHO meeting.

The executive committee of AASHO and highway department administrative officers have approved publication of the new "Information Guide" for project procedures, an effort to tighten up contract management that comes largely in response to findings of malpractice by the Blatnik committee.

Developed by a special committee on project procedures headed by Maine's David H. Stevens, retiring AASHO president, the new guide marks the first entrance of the association into the field of contract management. Heretofore, project procedures had been held to be the prerogative of each individual member department.

Although not binding on the member departments, the guide offers specific information intended to strengthen contract control at the project level. Sections of the guide cover: grading and minor structures; paving-type determination and documentation; flexible pavements; rigid pavements; channels of project supervision; and right-of-way.

Dwight H. Bray, Kentucky State Highway Engineer and newly elected president of AASHO, put it this way:

"The committee . . . has worked diligently to try to come up with a set of administrative ground rules that will insure proper and honest construction work. . . . The committee finds need, in some cases, for more and better trained inspection personnel on certain types of construction; but the principal recommendation has been that more checks and cross-checks were necessary to be certain to detect either incompetence or dishonesty on the part of any concerned personnel at all administrative levels."

And, speaking for the contractors who build the roads, Clare Miller, president-elect of the Associated General Contractors of America, warned:

"These guide lines should zealously guard against the possibility of limitations on production. Our costs are almost completely determined by our respective abilities to produce; any inspection procedures that might reduce production potentials would inevitably result in higher costs.

"The tail would be wagging the dog, if production is reduced to fit procedures rather than testing procedures expedited to fit production," Mr. Miller asserted.

The state highway departments made it obvious at the AASHO meeting that they intend to guard zealously the key role they have had in the federal-aid highway program since its inception. With the coming of 90-10 money on the Interstate system, many of them feel the federal government is playing too large a role, usurping some prerogatives that have traditionally belonged to the states.

"The federal-state relationship which has existed for 44 years is definitely threatened," said David Stevens, "by the trend towards centralization in the federal government, the very size of the national highway program, and improper practices on the part of some of the states. Whether or not the traditional federal-state relationship in the highway field will continue to exist will depend upon whether or not the states are capable of demonstrating that they have the ability, honesty and integrity to meet the criticism which will be leveled against the program.

"If the states cannot satisfactorily demonstrate that they do have the ability to carry on the program in the proper manner then the federal-state relationship will be further modified or eliminated. It will be a tragic day for the states if either should occur," concluded Mr. Stevens.

Fred Quinnell, Jr., Montana State Highway Engineer, decried "a gradual imposition of (federal) controls that threaten to impair, if not destroy, the initiative and self-determination of the state highway departments.

"No contention exists as to the right or desirability of the Bureau of Public Roads to maintain over-all coordination on the national level. No one questions their sincerity of purpose," Mr. Quinnell said. "Yet, there is contention as to the necessity for the extent of their surveillance of the departments through the ever-increasing number of checks and balances to maintain their control; a system that is becoming more and more restrictive and, in many cases, more and more destructive of the principle of true partnership."

Ellis Armstrong, outgoing Commissioner of Public Roads, defended the role of the federal government. "Any project engineer or contractor who is performing in accordance with plans and specification requirements should not be fearful of the results of record samples and tests taken and tested by other parties. No one should be aroused because of cross-checks of performance in the highway business," he said. "These are a normal part of all responsible public and private business activities.

AASHO President Dwight H. Bray

"These cross-checks will provide additional proof that the construction is what was intended and will be of great help in assuring the public that they are receiving full value for their dollars invested in highways," Mr. Armstrong declared.

In a meeting of chief administrative officers, AASHO took one of the preliminary steps necessary to sponsorship of a continuing research program. If approved by the states, AASHO will sponsor research projects with funds contributed each year by the member departments; money pledged by the states would be a portion of each state's share of federal funds earmarked for research and planning.

Rex M. Whitton, chief engineer of the Missouri State Highway Commission, was given the Thomas H. MacDonald Award for "continuous outstanding service." Mr. Whitton, who has more than 40 years experience with the Missouri department, is the first man to receive both of AASHO's top awards; in 1958, he received the Bartlett Award for "outstanding contributions to highway progress."

Dwight H. Bray, AASHO's new president, has been chief engineer of the Kentucky Department of Highways since 1948. California's State Highway Engineer, J. C. Womack, was elected first vice president.

After 17 Million Miles, Road Test Ends

Some of the nation's top highway officials took a day away from the AASHO meeting in Detroit (see above) to watch the last vehicle make its run on the test road at Ottawa, Ill., last Wednesday.

As the last truck made its last loop, the $27-million road test was completed. Its analysis and report remained to be done.

It ended a two-year, 17-million mile driving marathon that totaled 1.1 million applications of specific axle loads to each of the many test sections of rigid and flexible pavement.

Of the 836 test sections in the project, 716 were subjected to truck axle loads of 12,000 lb single to 48,000 lb tandem. The test project also includes 18 short-span bridges of structural steel, prestressed and reinforced concrete.

The brief ceremonies last Wednesday were attended by Ellis Armstrong, F. C. Turner and E. H. Holmes, of the Bureau of Public Roads; D. E. Stevens, D. H. Bray and A. E. Johnson of AASHO; Pyke Johnson and Fred Burggraff of the Highway Research Board; and E. R. Bartelsmeyer, Illinois State Highway Engineer.

The fleet of test trucks which reached a total of 126, piled up 310-million ton-miles of operation and consumed 3.7 million gal of fuel.

The trucks were driven by members of the Army Transportation Corps who totaled 895,000 man-hours of driving. The top driver logged 76,700 miles.

Special bridge tests will be continued this winter and next spring. Heavy military vehicles will also be used for further testing of the pavement sections during the spring thaw next year. Ultimately the eight-mile test project will be rehabilitated and incorporated in Interstate Route 80.

The test project is in charge of the Highway Research Board of the National Academy of Sciences-National Research Council. W. B. McKendrick, Jr., is project director.

The test project is financed by the states, the District of Columbia, Puerto Rico, BPR, Automobile Manufacturers Association, American Petroleum Institute and American Institute of Steel Construction.

Twin Cities Get $100-Million Plan

Action to solve the mounting water pollution problems of the Minneapolis-St. Paul area was outlined in an engineering report released last week by the Minneapolis-St. Paul Sanitary District. The report calls for a $100-million sewerage construction program and establishment of a 1,056-sq mi metropolitan area sanitary district.

Over half the construction money would be spent by 1970, the remainder by the year 2000. Proposed works include interceptors, pumping stations and sewage treatment plants.

The report is the result of a five-year study. It was authorized by the Sanitary District in 1956 and carried out by the St. Paul consulting engineer firm of Toltz, King, Duvall, Anderson & Associates, Inc.

Sanitary District officials and others interested are now studying the report. It could become the basis for implementing action by the 1961 session of the Minnesota legislature.

Actual construction would begin in 1963 and would proceed in three stages. First, $55-60 million would be spent by 1970. Work would be accelerated for the first three years. Second, about $11 million would be spent from 1970 to 1980. Third, the remainder would be spent during the final 20 years.

The enlarged sanitary district would encompass a rectangular area measuring about 30 x 34 miles, extending into parts of seven counties: Hennepin, Ramsey, Anoka, Washington, Dakota, Scott and Carver. It would include 82 cities, villages and townships. The Minneapolis-St. Paul Sanitary District now covers only the two central cities; but through sewage service contracts and ordinances, it serves an additional area of 193 sq mi, including 24 suburbs and several agencies.

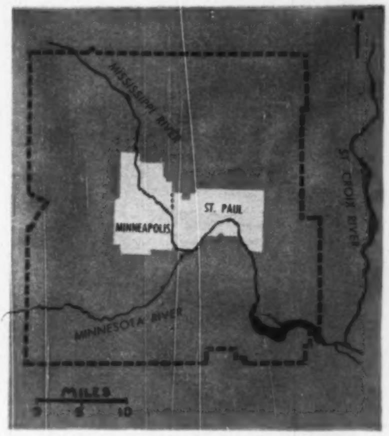
Existing sewerage facilities in the metropolitan area are inadequate now, the report points out. Eleven publicly owned and several privately owned plants treat a total of 170 mgd. The Minneapolis-St. Paul plant was designed for an average daily flow of 134 million gal, but now treats over 150 mgd of the area total. Instead of the 910,000 maximum population the plant was designed to serve, it now serves just over a million. Population projections for the proposed new district show that 2 million in 1980 and 2.6 million in 2000 will be served by sewer systems.

Total population in the seven-county metropolitan area is now about 1.52 million. It is expected to increase to 2.32 million by 1980 and to 3 million by 2000. Contamination of ground water supplies is forcing many suburban communities to replace their individual home septic tanks with public sewer systems.

The Minneapolis-St. Paul plant is basically primary only, but also provides intermediate treatment in the form of flocculation and chemical dosing when the river is low. The new plants would provide secondary treatment.

Four alternate projects are recommended in the report. Basic to each is a main central city treatment plant and one downriver regional plant. One of the four involves one upriver plant in addition, and another involves two upriver plants. No firm conclusions have been reached on the degree of treatment needed at each plant, but the estimates are based on the assumption that the conventional activated-sludge process is needed upriver and high-rate activated sludge will suffice downriver.

Estimated construction costs of the four projects range from $95 million to $105 million. A fifth alternate, involving individual treatment plants for the communities in the area, would have cost $151 million. Annual costs over the 40-year construction period will vary from $6.3 million to $6.7 million, the report says. Cost per capita is estimated at about $3.50 per year.



NEW SEWER DISTRICT would cover 30 x 34-mile metropolitan area.

The cost estimates are based on an ENR Construction Cost Index of 800. An index value of 830.61 this week (see p. 83) shows present costs running close to 4% higher.

Water Tunnel Must Beat Bridge

New York City had better get going soon on its proposed 6½-mile water tunnel to Staten Island, city officials were urged last week. The alternative is to get caught short by a population explosion starting in 1964 when the Narrows Bridge opens.

The warning came in the form of engineering recommendations submitted by the Board of Water Supply to the Board of Estimate, which controls city spending. The report was the result of a 16-month study authorized by the Board of Estimate.

The project will cost $31.1 million, according to Board of Water Supply estimates: $24.1 million for the tunnel itself, a 33,000-ft-long, 10-ft-dia, concrete-lined bore; $1.4 million for a pipeline in Staten Island connecting the tunnel to existing Silver Lake Reservoir; and $5.5 million for covered storage reservoirs in Staten Island (one of New York City's five boroughs).

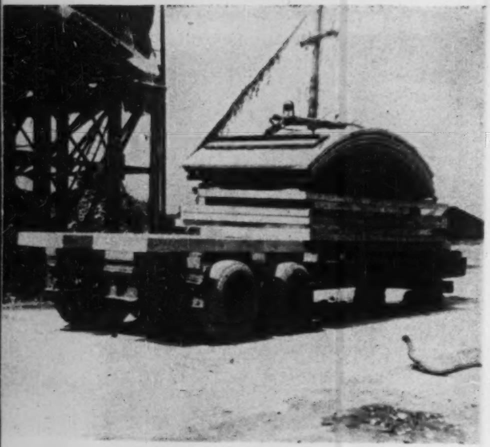
Tunneling, the most time-consuming part of the job, could start as early as this summer if the Board of Estimate gives fast approval and no snags develop in property acquisition and other preliminaries.

The tunnel will be driven under a single contract. It will require a 900-ft-deep shaft at each end. Whether it will be driven from one heading or two, however, will be left to the contractor to decide.

The covered reservoirs will have a capacity of 100 million gal. The design has not been definitely settled. A possibility is about 10 prestressed concrete tanks 200 ft in diameter. Their storage level would be about 40 ft higher than the level of Silver Lake Reservoir.

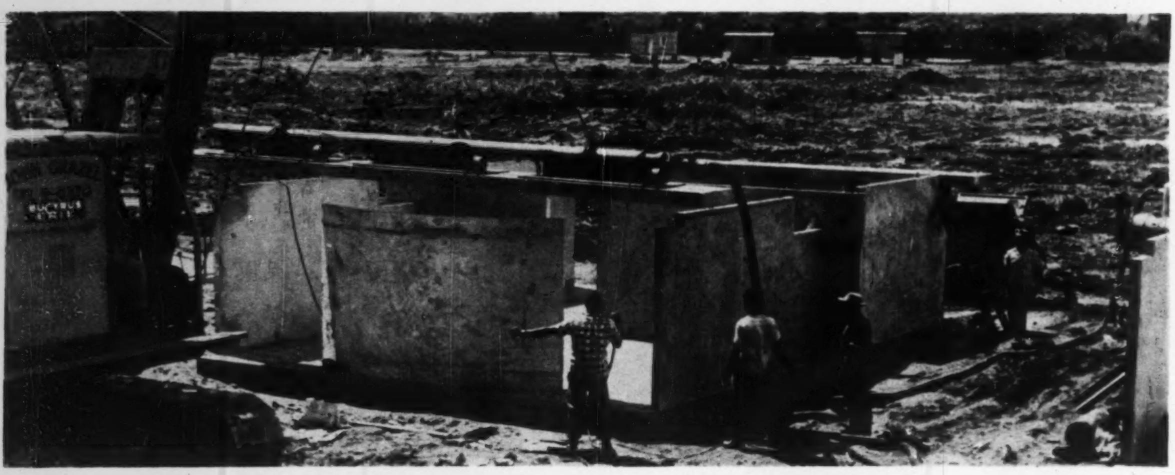
The new works are expected to meet Staten Island water demands through the year 2000 and possibly beyond. Population projections made by the Board of Water Supply show the borough's population increasing from 221,000 at present to 590,000 in 1975 and 700,000 in 2000. Peak daily demand is projected from 40 million gal a day in 1957 to 120 mgd in 1970 and 170 mgd in 2000.

Flow capacity of the proposed tunnel would be 300 mgd, well beyond the maximum consumption foreseen. However, the tunnel in conjunction with the new higher reservoirs would have an added function to that of supplying Staten Island water. They would help maintain pressure in areas of Brooklyn, Manhattan and Queens now subject to pressure drops during peak demand periods. This function would not necessarily involve backflow from Staten Island, but backflow might occur during extreme demand periods.



1. Simple panels move on trucks.

2. They arrive at 30-acre site 45 miles from plant.



4. Vacuum mats handle roof beams spanning across curved end-wall panels.

Six Steps to Produce a House

Builders are rushing completion of 100 precast concrete homes for hurricane victims in the Humacao area of east central Puerto Rico.

The homes are going up at a cost to the Puerto Rican government of only $1,000 each. The builders and material suppliers—all involved in commercial housing projects on the island—are absorbing losses on the job to make the price possible. The program was proposed by IBEC Housing Corp. (a subsidiary of the International Basic Economy Corp., New York City) within hours after Hurricane Donna cut across the island early in September.

Here is what IBEC and the contributing suppliers will deliver: A house shell—nearly 650 sq ft in area—on a foundation slab measuring about 21 x 30 ft with front and back doors and eight jalousie-type windows installed. Openings are provided for later plumbing installations. The immediate goal is to get families out of crowded lowland tent areas.

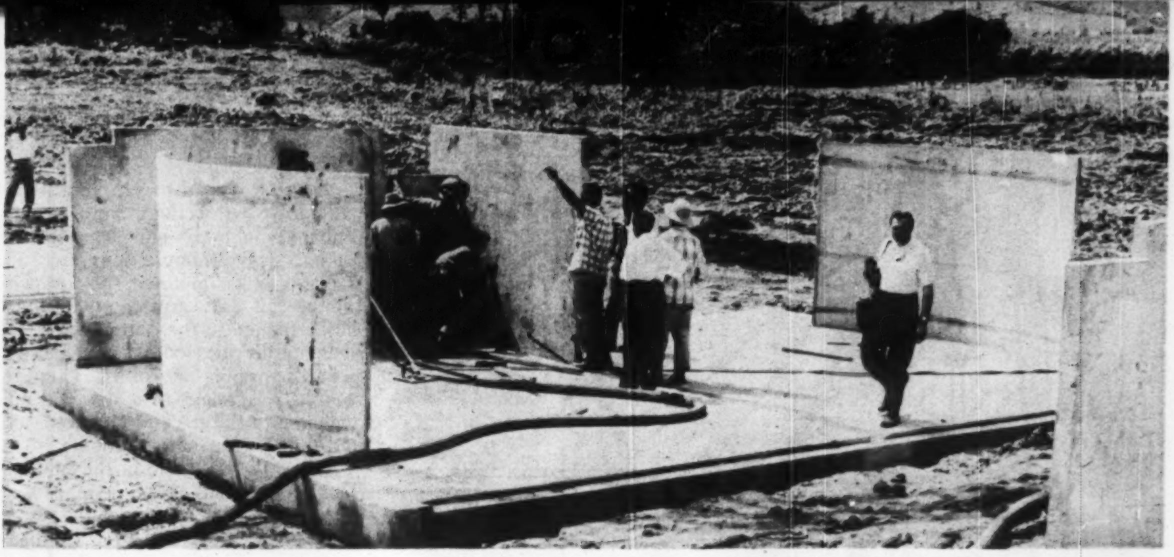
Drawing on existing plans and on tested components planned for future commercial projects, IBEC is erecting a precast house that includes curved end-wall panels and a twin barrel arch roof.

Components are precast in IBEC's yard at their Lomas Verdes housing project near San Juan and trucked 45 miles to the job. The entire package includes 12 elements: six flat wall sections, two curved wall sections, two roof beams and two roof sections.

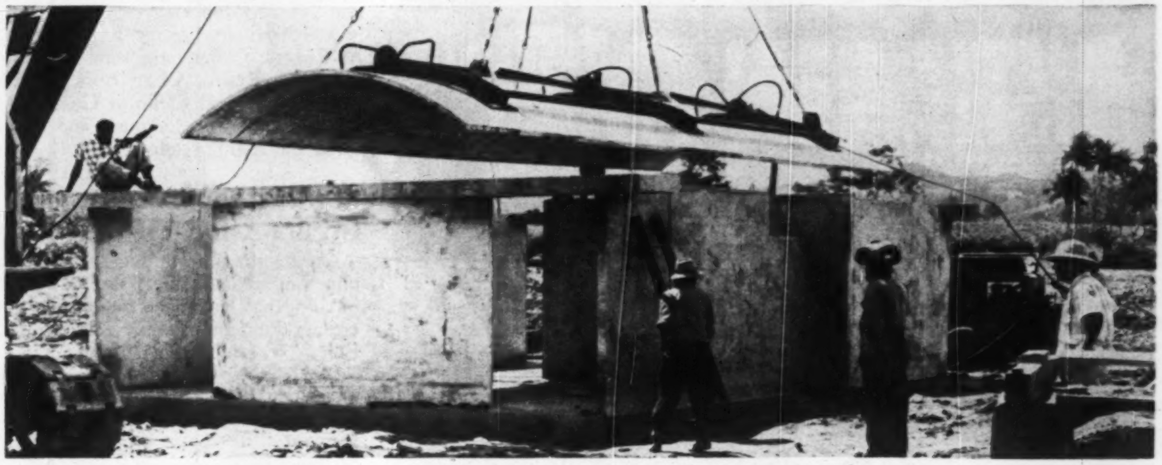
Two wall panels go along each side and a pair of transverse wall panels cut across the short axis of each house. At the ends of the house—21 ft wide—curved wall panels fill the center with openings at either side for a window and a door. These curved shell walls are only 2 in. thick, reinforced with a 6x6 8-ga mesh and at the corners with a single bent No. 3 bar extending 2 ft along each edge. Their curve is just over 2 ft; chord length is 11 ft 9 in.

The roof shells, 5 tons each, rest on beams placed across the ends of the house. The beams' 2-ft 6-in. width is enough to "cover" the entire 2-ft width of curve in the end wall panels directly below them.

Each roof shell bears on the end beams and on the transverse wall panels for a total of six points—three to each side of each shell. They are 2 in. thick and reinforced with the same 6x6 8-ga highway mesh as the curved wall panels, but three No. 3 bars, bent to follow the stress pattern around the



3. **As wall panels are plumbed, welder tacks connections, eliminating double steps.**



5. **Two five-ton roof shells cover each unit. Six welds per shell tie them down.**

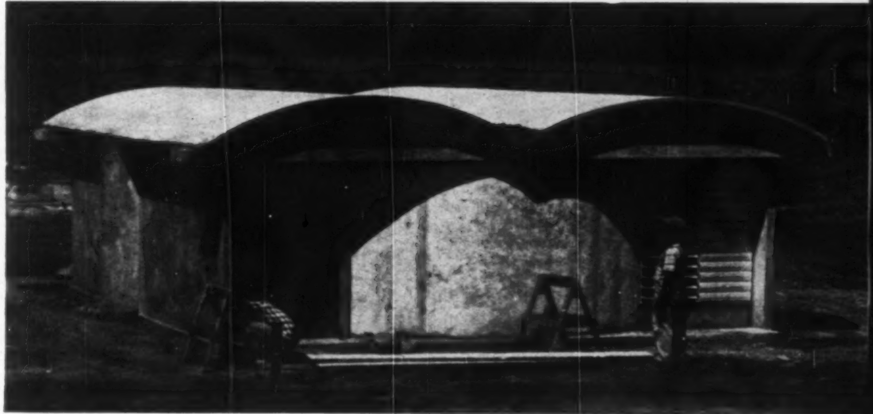
for $1,000

bearing points, are embedded lengthwise in each side of each shell.

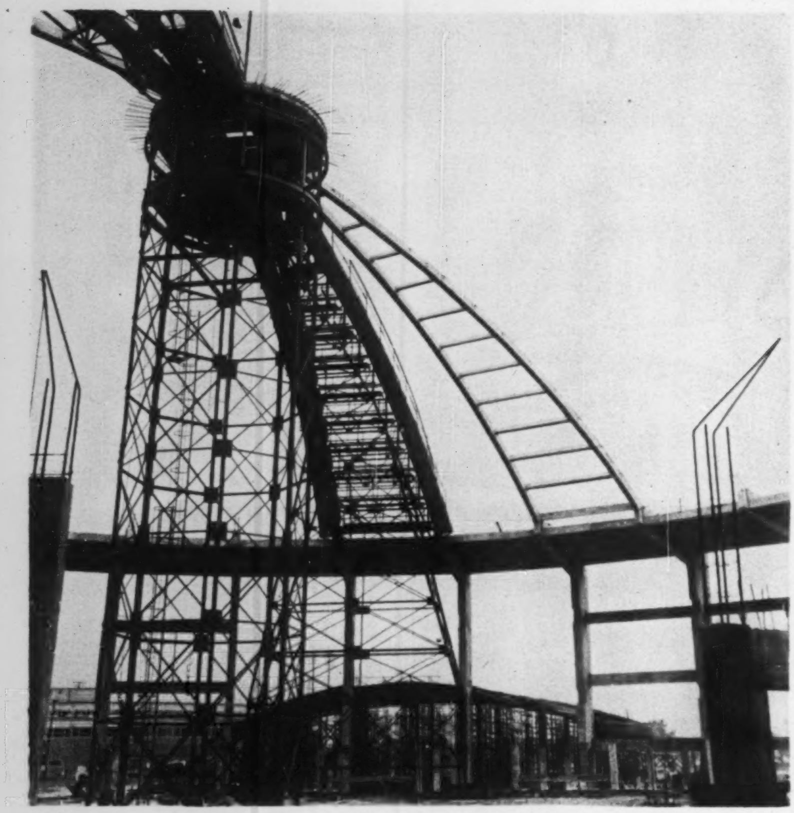
Erection is quick and simple. A crew of seven erected one house in an hour to test the design for high-speed construction. Side and transverse wall panels rest in slots cast across and along the edges of the foundation slab. Bent rod loops serve as lifting eyes along the top edge of each panel; a simple channel picking frame on a truck crane shifts the units from truck to foundation. Largest wall panel weighs 2½ tons. A welder works side by side with the placing gang, running connections between panels and from panels to foundation as soon as the walls are plumbed. IBEC employs vacuum mats to place the flat roof beams and barrel arch roof shells.

Welding the six connections of each roof arch completes the house shell frame. Workmen seal the valley between the shells with a mastic and set door frames and window units.

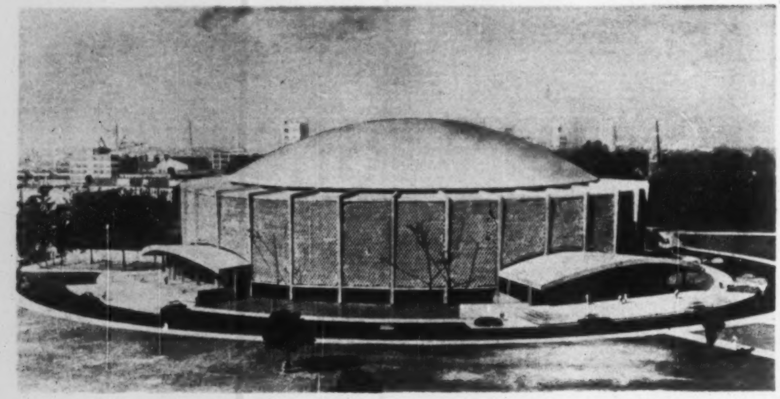
Building supply firms cooperating with IBEC Housing in the emergency project are Tim Manufacturing Co., General Equipment Co., Hato Rey Building Co., Caribe Lumber & Trading Co., Puerto Rico Millwork Corp. and Standard Steel and Wire Co.



6. **Complete house shell is finished in an hour.**



Rolling Scaffolds Form . . .



. . . Domed Roof for Coliseum

Two rail-mounted steel scaffolds, traveling on a circular track around the building perimeter, speeded construction of Jacksonville's Coliseum, which opened last week.

The $3-million structure is roofed with a concrete dome more than 300 ft in diameter and nearly 100 ft high. It will seat from 8,000 to 12,000 in two concourse levels. Seating capacity will depend on the event staged. Events will range from ice hockey and basketball to trade shows.

The roof framing consists of 32 arch ribs spaced at 11¼ deg arc segments around the circle and supported on inverted L-shaped concrete columns at the exterior wall. Framing between these ribs are circumferential concrete purlins spaced at 10 ft radially. Bulb tees, spaced at 33 in., span in a general radial direction, carrying compressed fiber board roofing plank chosen for its insulating and acoustical qualities as well as for its structural use.

Daniel Construction Co. of Florida, Inc., cast the ribs in pairs tied together by the intercepted purlins. Opposing pairs were cast simultaneously to form complete arches at each construction stage. Fill-in purlins between adjacent pairs of dome ribs were cast after all the ribs were in place.

A central trussed tower, fabricated of structural steel sections, supported the temporary falsework and the soffit form for a concrete compression ring. The steel scaffolds supported the formwork for the ribs. The trussed scaffold arm, which framed to the central tower, was hydraulically lowered after each use to permit stripping of forms. Then the scaffold was rolled to a new location, anchored to the tracks with screw jacks, and raised again into position.

A double wall encloses the building. The outside wall, at the peripheral columns, consists of perforated brick, which serves as insulation from the sun's heat. The interior wall, directly under the dome support points, is glass and concrete block.

Architects are George R. Fisher and A. Eugene Cellar; structural engineer, Gomer E. Kraus. All are from Jacksonville. Dixie Steel & Form Co. of San Antonio, Texas, designed and fabricated the rolling scaffold.

Contractors Win a Round In 'Set-Aside' Dispute

Contractor pressure has succeeded in punching at least one hole in the wall of rules that have been established governing the Small Business Administration's "set-aside" program.

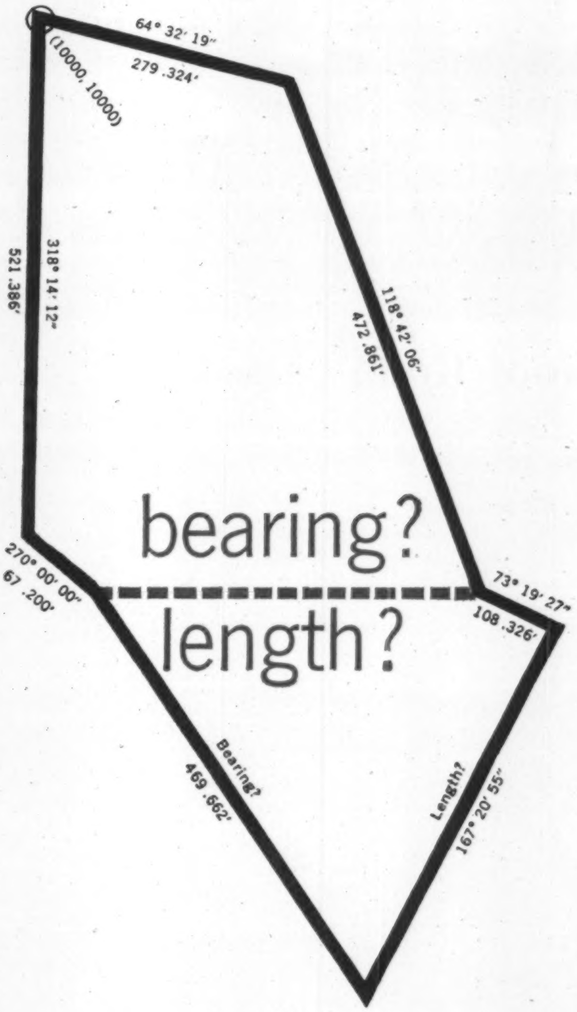
The Fort Worth, Tex., District Corps of Engineers stripped off the set-aside label placed on its Proctor Dam and Reservoir Project, which is up for bids January 10 (ENR Nov. 3, p. 77). This job involves an estimated $1 million worth of spillway, excavation and embankment work.

There are also some indications that the big project that started the furor—a $4.5-million hospital to be built at Sheppard Air Force Base—may also be removed from the set-aside list (ENR Dec. 1, p. 29).

The Associated General Contractors exerted some pressure when it was revealed that the two Texas projects had been thrown open to bidding to only contracting companies defined as small business under the SBA concept (annual average volume of $5 million or less).

Since the Texas incident, AGC has met with SBA Administrator Philip McCallum to push for two policy changes:

- Lift the dollar volume definition from its $5-million level.
- Consider the dollar volume of subcontracts going to small firms when considering the distribution expenditures for construction. Only prime-contract volume is considered now.



solve
it
in
seconds!

Low-cost IBM 1620 Computer frees your engineering staff for more creative work

The low-cost IBM 1620 Engineering Computer solves the traverse problem automatically, in seconds. It also balances the traverse if misclosure is within tolerance. It computes the area within the closed traverse. Versatile and fast, the 1620 can solve interdependent traverse and triangulation problems and many others not directly associated with surveys.

The time saved by the low-cost 1620 in computations like these enables your engineers to spend more time utilizing the results of surveys and less time reducing raw data to usable form.

A readily adaptable survey analysis program has been developed by IBM and will be available without cost later this year. This is another example of Balanced Data Processing, machines supported by a complete range of services. Ask your IBM representative about the advantages of the 1620 and how they can be put to use in your operation. Like all IBM Data Processing equipment, the 1620 may be purchased or leased.

The IBM 1620 is a low-cost, desk-size engineering computer with features previously found only in larger systems. It offers solid state design, magnetic core storage and high-speed internal computing performance. Its versatility and ease of operation recommend it for such engineering applications as highway cut-and-fill calculation, bridge design analysis, earthwork design and many others.

BALANCED DATA PROCESSING IBM®

Folded Plates Roof Round Bank

A combination of structural steel and precast concrete provides an economical roof framing system with only one interior column for a circular bank building in Dallas.

Tex-Crete Structural Products Co. of Dallas precast a folded-plate roof in 32 pie-shaped units. A five-man crew erected the concrete in six hours with one crane.

A structural steel framing system supporting the folded-plate roof has long-span joists spanning the 40-ft radius between 32 exterior wide-flange columns and a central interior column. At the interior column, the joists bear on a large circular cap plate, which is stiffened with radial brackets. The central column is a pipe section 12 in. in diameter.

The banking area will be enclosed with glass walls, 22 ft high.

Total building area is increased to 15,000 sq ft by an L-shaped portion, which can be extended by a second-floor addition.

W. H. Cothrum & Co. is the builder; I. V. Kipcak & Associates is structural engineer. Both are from Dallas. Owner is the First Citizens Bank.

Around the Country . . .

• **Port officers in dock**—The Department of Justice will prosecute three officials of the Port of New York Authority for contempt of Congress. They have refused to supply records to a House subcommittee investigating the authority. A conviction can bring a fine as high as $1,000 or up to one year in jail.

• **Bridge bids rejected**—The California Division of Highways has rejected low bids totaling about $14 million to build the substructure and superstructure of the proposed suspension bridge connecting San Pedro and Terminal Island across the main channel of Los Angeles Harbor (ENR Aug. 11, p. 30). Reason is inability to sell bonds to finance the project at this time. Bond terms are being revised and bids will be called again in a few months.

• **Port contract**—The first construction contract for a $15-million cargo passenger terminal to be built on the Port of Los Angeles' main channel has been awarded to the American Bridge Division of United States Steel Corp. at $1.57 million.

• **Home for the code**—The New York Division of Housing will ask the state legislature to establish a five-man building code council within the division. The division took over code administration when the independent State Building Code Commission was abolished a couple of years ago.

• **Columns drop**—Two 32-ft-high reinforced concrete columns—one several days old, the other just cast—toppled over at a church construction site in East Point, Ga., near Atlanta injuring four workmen. The four-day-old column carried the newer one with it. Workers were stripping the first and finishing the second when the accident occurred.

• **Japanese prefabs**—Japan's first prefabricated, earthquake-proof steel house is now being sold on the Japanese domestic market. Nihon Denken, Ltd., the designer and builder of the house, has a monthly production capacity of 200 units. The building is made of light steel panels. Cost ranges from $1,972 to $3,055 in Japan, excluding transportation charges.

$25-Million Space Labs Under Way Near L. A.

Construction is starting on the largest space research and engineering center in the country—a $25-million complex, for Space Technology Laboratories, Inc. It will be located at Redondo Beach near Los Angeles.

When completed, the center will employ over 5,000 persons including some 2,000 engineers and scientists.

First construction phase—to cover 70 of the site's 110 acres—will consist of 10 structures. These will include six two-story research-office buildings, a five-story engineering building, a library auditorium, a service building and an eight-story headquarters building for the corporation.

Though the buildings will be grouped in a campus layout around a central mall, each will be self-sufficient with its own utilities including air-conditioning and electrical services. The quickly changing nature of space research and development with its constant demands for new and varied lab and plant services eliminates any economy gained from a central utility building, according to the designers.

Since 1954, STL—a subsidiary of Thompson Ramo Wooldridge, Inc.—has provided engineering and technical direction for the U. S. Air Force ballistic missile program. It also designed, built and traced in flight the Pioneer I, Explorer VI and Pioneer V satellites. Now, STL engineers are completing a NASA study aimed at producing a "soft" landing on the moon for space vehicles.

The Redondo Beach labs have been designed by Albert C. Martin & Associates, Los Angeles. Construction contract for the center has gone to Twaits-Wittenberg Co., Los Angeles.

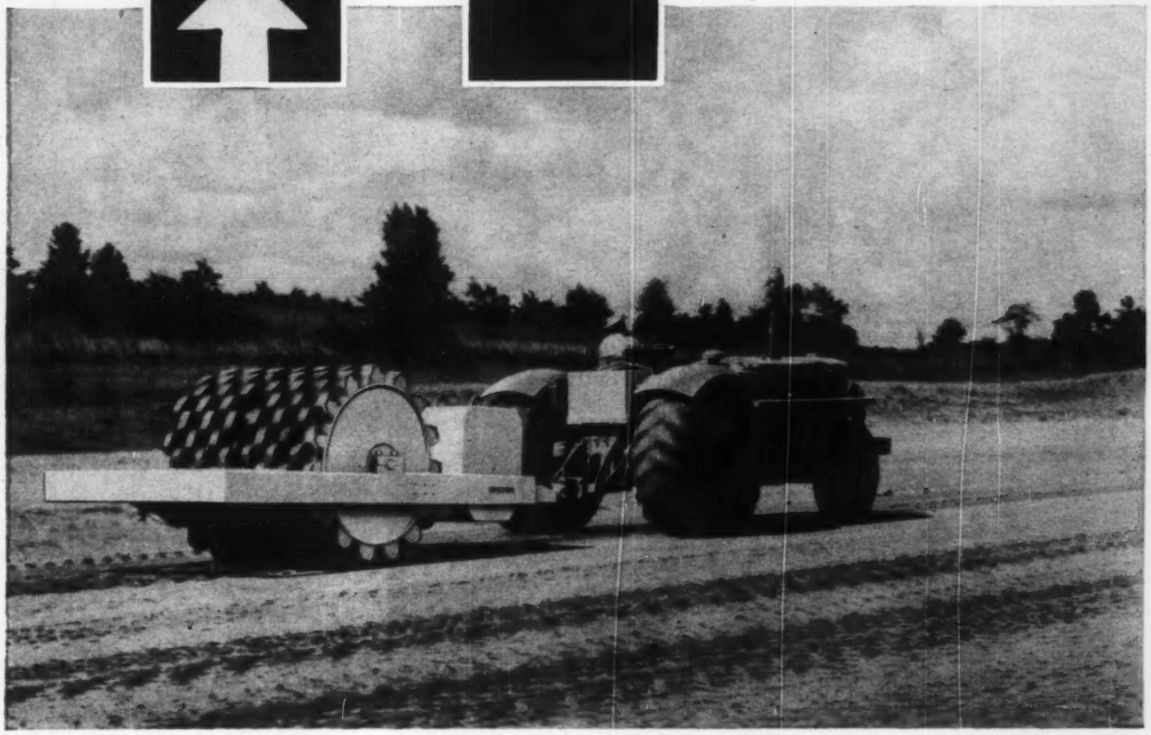
Engineering Teachers' Pay Up 14.7% in Two Years

The average total income of engineering teachers has increased by 14.7% in the past two years, according to Engineers Joint Council.

Average salary for engineering teachers in American colleges is now $8,534. This is supplemented by an average of $2,479 from outside professional income. The median teaching salary for instructors is $5,380, for full professors, $10,500.

Since the first EJC survey in 1956 teaching salaries have jumped 31.1% and incomes from outside sources have risen 11.3%.

The survey, entitled "Salaries and Incomes of Engineering Teachers—1960," was made possible by a National Science Foundation grant, and covered more than one-half the total number of engineering teachers.



Compaction for 3¢ per cubic yard

HYSTER® has it!

Contractors report:

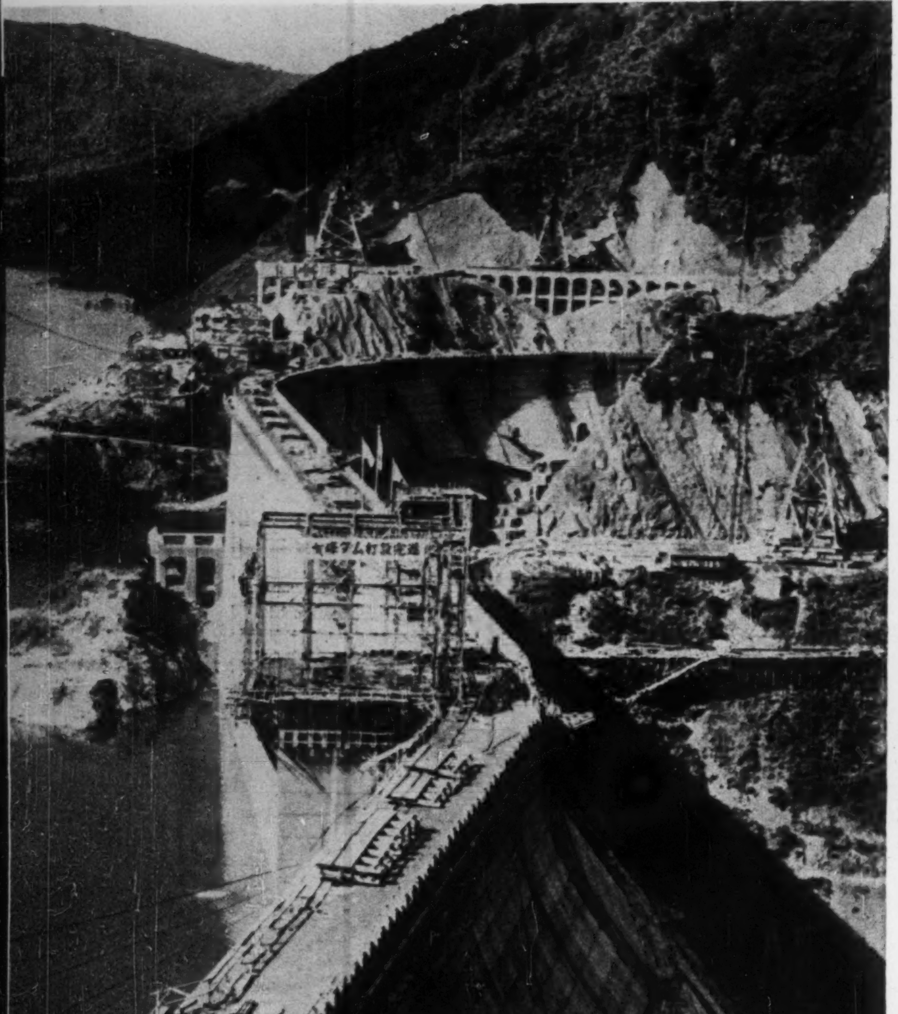
- New Hyster Model D Tamping rollers get compaction at speeds to 15 MPH.
- High speed rolling cuts compaction costs to less than three cents per cubic yard.
- Large contact area of tamping feet—21 sq. in.—gives fast "walk out"!

Ask your Caterpillar-Hyster dealer for a demonstration soon.

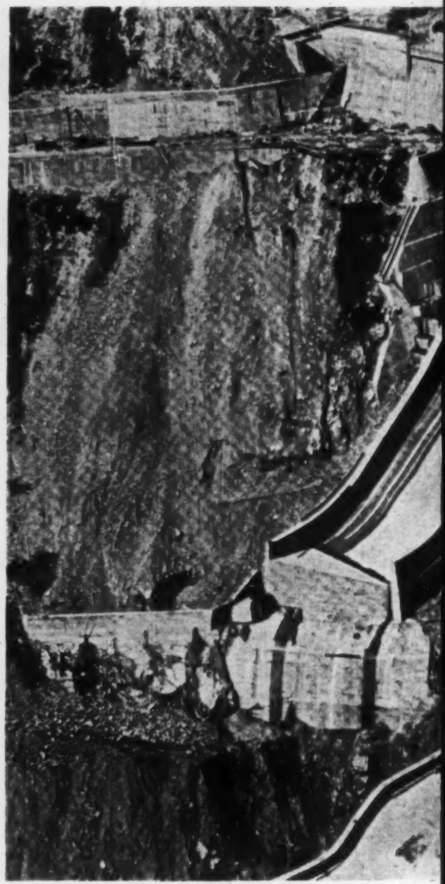
Cat and Caterpillar are registered trademarks of Caterpillar Tractor Co.

TRACTOR EQUIPMENT DIVISION—Construction and logging equipment
INDUSTRIAL TRUCK DIVISION—Lift trucks, mobile cranes, straddle carriers
MARTIN TRAILER DIVISION—Heavy machinery hauling trailers
INTERNATIONAL DIVISION—Overseas manufacturing, sales and service
Factories: Portland, Oregon (Home Office) • Danville, Ill. • Peoria, Ill. • Kewanee, Ill. • Nijmegen, The Netherlands • Glasgow, Scotland • Sao Paulo, Brazil • Sydney, Australia (Licensee)

HYSTER COMPANY
TRACTOR EQUIPMENT DIVISION
P. O. Box 328 • Peoria, Illinois



Doglegged alignment keeps Arimine Dam away from bad rock.



Kamishiiba's performance gave

Japanese

By Waldo G. Bowman, Editor

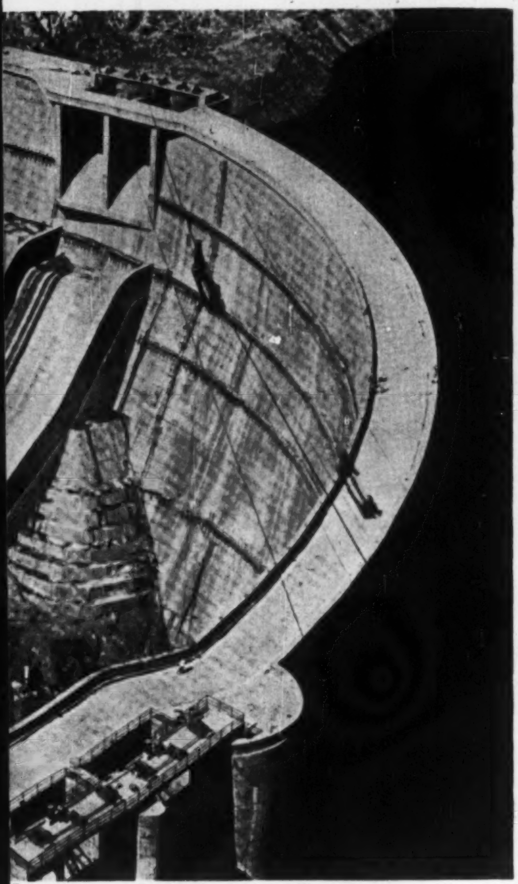
Japan has just played host to the annual executive meeting of the International Committee on Large Dams, attended by 75 delegates from 22 countries. And there could have been no better time to display the products of her dambuilders.

Last year alone Japan completed 91 dams over 50 ft high. A dozen of them were in the 200-ft class and four exceeded 300 ft. And she presently has 99 others under construction, including one that will be 612 ft high and another to exceed 500 ft.

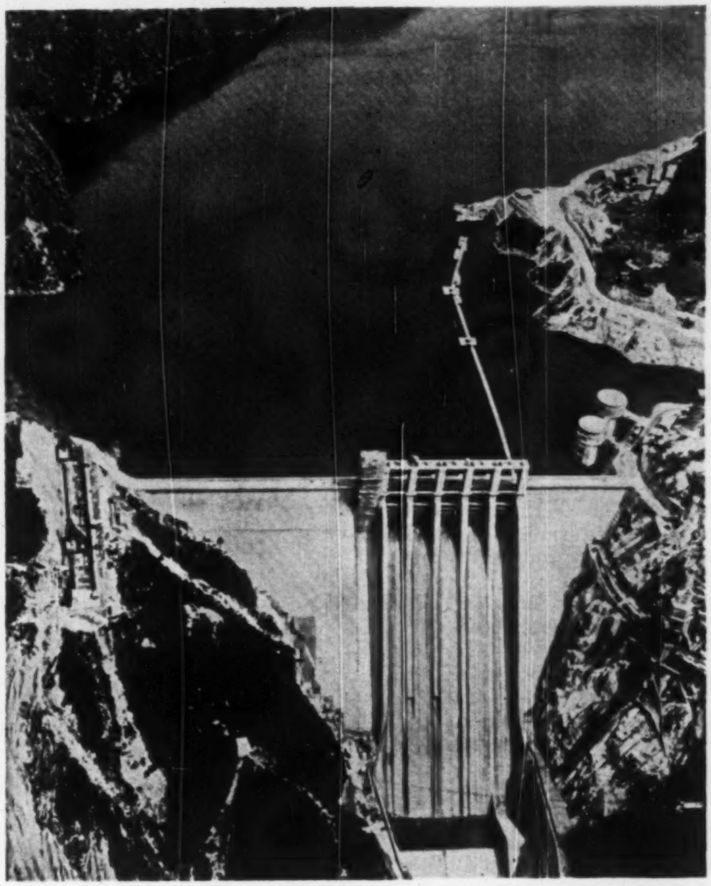
• **Technique matches output**—Such a prolific output of dams probably surpasses that of any nation in the world today. The number would certainly

---

***Mr. Bowman's** on-the-spot account shows that Japan's dambuilders are matching the busy pace he reported (ENR Nov. 24, p. 40) for Japanese construction in general.*



rise to confidence in high arches.



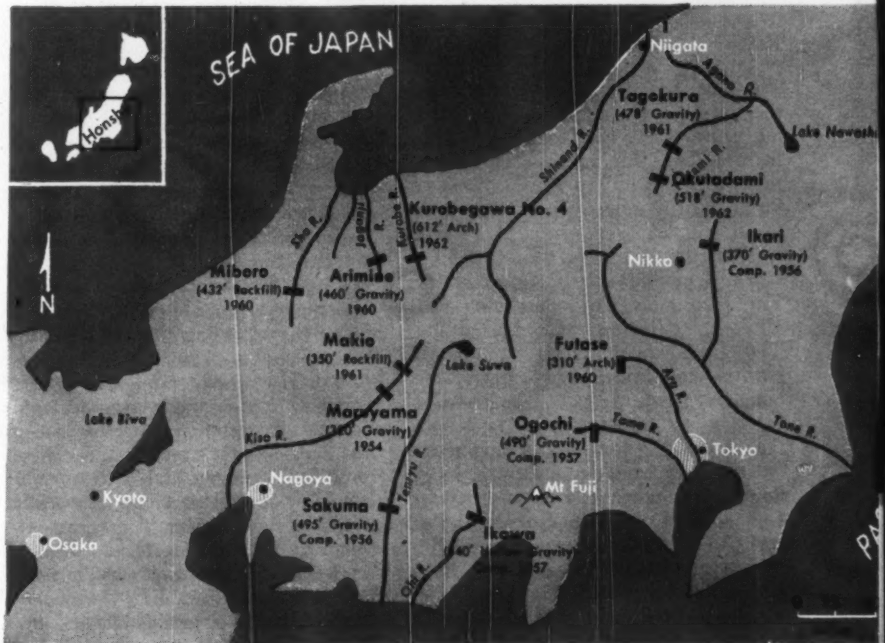
Sakuma Dam proved the value of mechanization.

Dambuilding Is a Flourishing Art

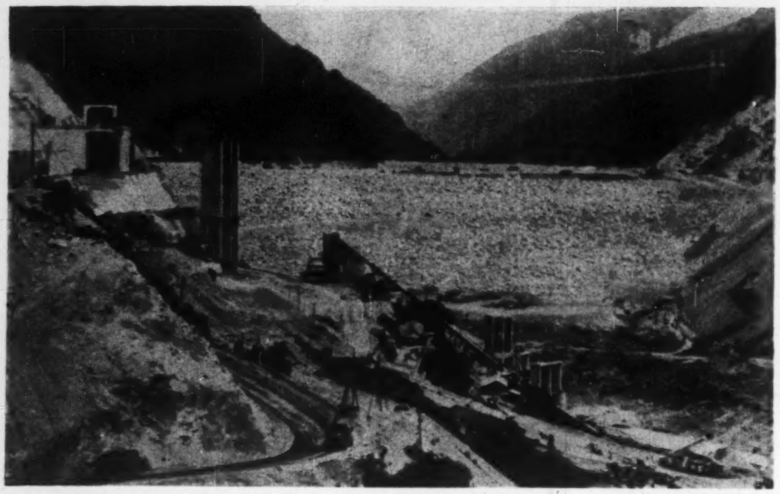
support a claim for more dams per acre and perhaps more per capita than any other country. But a more significant fact about Japanese dambuilding is that its steady 10-year rise to this crescendo has been accompanied by a corresponding rise in design knowledge and construction technique.

Pre-war Japanese dams—and there were a great many of them—were of types and sizes that neither attracted much notice nor presented much difficulty in design or construction. Since 1950, however, the size of dams attempted by the Japanese has steadily increased, and a variety of types has been introduced. All this bespeaks confidence born of design and construction knowledge of greatly increased scope. And it has been gained in a very short time.

• Power is the big lure—Why are so many dams being built in Japan? The simple, although not the sole, answer is for power. Industrial Japan has


Honshu
SEA OF JAPAN
N
Niigata
Agano R.
Tagokura
(478' Gravity)
1961
Lake Nawash
Shinano R.
Tadami R.
Okutadami
(518' Gravity)
1962
Sho R.
Jogonji R.
Kurobe R.
Kurobegawa No. 4
(612' Arch)
1962
Ikari
(370' Gravity)
Comp. 1956
Nikko
Miboro
(432' Rockfill)
1960
Arimine
(460' Gravity)
1960
Makio
(350' Rockfill)
1961
Lake Suwa
Futase
(310' Arch)
1960
Ara R.
Lake Biwa
Kiso R.
Maruyama
(320' Gravity)
1954
Tenryu R.
Ogochi
(490' Gravity)
Comp. 1957
Tama R.
Tone R.
Tokyo
Nagoya
Kyoto
Mt Fuji
Sakuma
(495' Gravity)
Comp. 1956
Ikawa
Comp. 1957
Oi R.
Osaka

Honshu dams were toured by visiting large-dam group.



MIBORO is Japan's first rockfill dam and one of the world's notable examples of the type. Height, 432 ft. Volume, 10.6 million cu yd.

gorged itself on kilowatt-hours, but hungers for more. It used 74 billion kwh in 1959, double what it used eight years before. To produce this took a generating capacity of 18.5 million kilowatts, also twice that of eight years ago. Of this capacity, 10.5 million kw was hydro and 8 million steam, representing an eight-year growth of 75% and 170% respectively.

The fact that steam generating capacity has increased more than twice as fast as hydro, despite the high tempo of power-dam construction, emphasizes how eager for electric power Japan has become. It also reflects the fact that steam generating capacity can be added faster and more cheaply than hydro, which suggests that dambuilding in Japan may have reached its peak. It does not mean that dam building will stop, however, for even very expensive hydro power is often economical for the peak loads of a system.

Besides, dams have other uses, such as water supply, irrigation and flood control. And Japan needs all three. Actually, of the 91 dams completed last year, 33 were exclusively for irrigation and flood control; and of the 99 still under construction, 50 are being built for these same purposes. It may also be noted that the majority, if not all, of Japan's big new dams are multi-purpose structures, and that a number of suitable sites are still left for developments of that kind, offering acceptable benefit-to-cost ratios.

Another reason why Japan builds so many dams is that its topography and climate are ideal for the purpose, particularly for power dams. All of the islands are mountainous, and Honshu, the main island and scene of most of the large dams, has a backbone of mountain ranges with peaks soaring to 10,000 ft. The rivers that drop out of these mountains are short and steep. They are fed by typhoon rains from the Pacific and melting snow originating in the moist cold air from Siberia. In some areas the annual precipitation totals as much as 150 in. The average for the entire country is a respectable 60 in.

There are also other conditions that affect dambuilding—for good or ill. The mountains are geologically complicated, containing folds and faults. The rivers, being steep, are highly erosive and bring down gravel and boulders that reduce the storage capacity of reservoirs. They also fluctuate widely from devastating floods on the one hand to greatly reduced flows on the other, as a result of winter freezing and summer droughts. But water is available in ample quantity every year to be stored, and high head is available for power. The building of dams was inevitable, first the run-of-river type and now, with modern techniques and knowledge, the bigger ones higher up in the mountains that store water for multiple purposes.

• Who builds the dams? In Japan, as in other countries, the responsibility for building dams is divided. The Ministry of Agriculture and Forestry handles irrigation dams. The Ministry of Construction handles dams whose primary purpose is flood control. The prefectural governments build many modest-size dams for irrigation, flood control and even for power. But it is in the national government's Electric Power Development Company and the nine big private power companies that multi-purpose power-dam design and construction reaches its prime. It is from these organizations that Japan's larger and more important dams emerge.

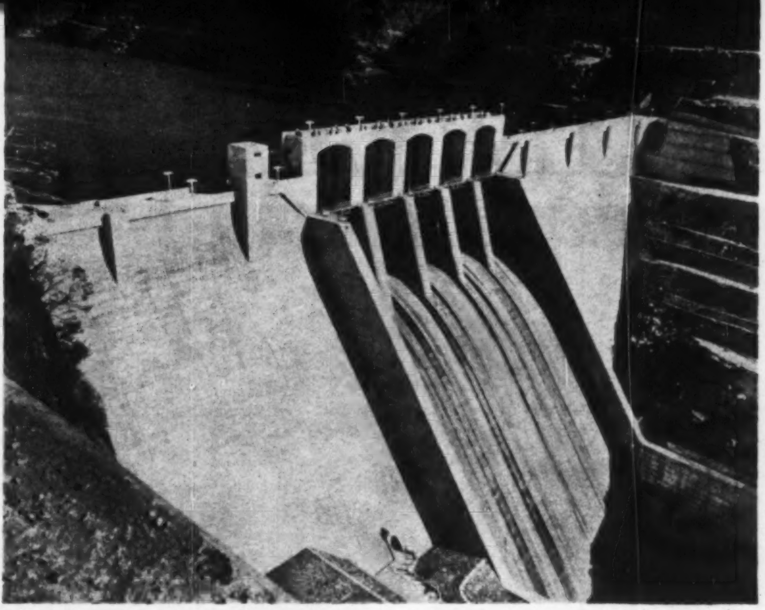
Japan's power industry was for many years in the hands of a national government monopoly known as the Nippon Electric Generation and Transmission Co. At the end of World War II, however, this big combine was dissolved and re-organized as nine privately owned utilities, each with a designated area of operations. There is a power company for each of the islands of Hokkaido, Kyushu and Shikoku, while the main island of Honshu is divided among the other six, in north-to-south order, Tohoku, Tokyo, Chubu, Hokuriku, Kansai and Chugoku. These companies were empowered to build and operate electric generating facilities, but on the theory that there would be a number of big hydro jobs that they would not be financially capable of undertaking, a government-owned firm named the Electric Power Development Company was formed. As it has turned out, EPDC is building the majority of Japan's bigger dams, although several of the private companies have projects that rival anything EPDC is doing.

It is not possible to review all of Japan's major dams, or even all of those shown to the delegates of the International Commission on Large Dams on a 10-day inspection trip throughout the central part of Honshu, where most of the big dams are located. But the significant facts about the most important ones will serve to emphasize the character of present day dam development in Japan.

• Construction is mechanized – It should be noted that Japan follows U. S. practice in awarding construction contracts to private contractors on competitive bids. Design is by the owner's engineering departments, aided when required by private consulting engineers —sometimes Japanese, often foreign. No U. S. foreign aid is involved in the financing of Japan's power facilities, but large World Bank loans have played a significant role.

Mechanized construction puts present dambuilding in Japan in a different class from prewar operations. This is true despite the fact that with old methods a Japanese contractor, Hazama-Gumi, Ltd. was able to build in the late '30s such a remarkable structure as the Sue-fung Dam on the Yalu River on the northern border of Korea. This dam is 350 ft high and contains 4.6 million cu yd of masonry. But it was built with hordes of workers and a minimum of equipment.

Successful mechanization of dam construction in Japan may be considered to have started with EPDC's Sakuma Dam on the Tenryu River. Hazama-Gumi completed it in 1956 after a construction period of unheard-of brevity in Japan—3½ years. Sakuma is of major size—a straight gravity, overflow-type structure 495 ft high and contain-



MARUYAMA, built during the transition from old to new methods, helped set Japanese dambuilders firmly on the path to mechanized construction.

ing 1.44 million cu yd of concrete. It also includes a 350,000-kw power plant.

For the Sakuma work, EPDC purchased several million dollars worth of U. S. construction equipment and rented it to the contractor. The firm has followed this practice since. Cableways, concrete buckets, shovels, tractors and trucks, and modern tunneling equipment was included. Today most of this equipment is of Japanese manufacture, for as a recent EPDC report states: "the introduction of mechanized equipment stimulated domestic manufacturers so that production of heavy construction equipment has grown almost five times in the past five years."

Two other large dams antedated Sakuma by a year or two, and although their construction was not as fully mechanized, they helped to establish the pattern. The first, Maruyama Dam, is a 320-ft-high concrete gravity structure on the Kiso River, built by the Kansai Electric Power Co. The second dam, Kamishiiba, built on Kyushu Island by the Kyushu Electric Power Co, was the first high arch dam in Japan. It is 361 ft high and contains 520,000 cu yd of concrete, which is about half the amount a comparable gravity dam would have required.

For certain hard-to-reach damsites, this kind of saving had intrigued the Japanese previously, but their fear of earthquakes and lack of design knowledge had prevented adoption of the arch type dam. Kamishiiba, designed with the help of Overseas Consultants, Inc., of New York City, a former consortium of several U. S. firms, gave Japan confidence in the arch-type dam. The confidence was increased in 1955 by successful performance of the dam's two ski jump spillways after a typhoon.

• Biggest job of all—There can be little doubt that the experience with Kamishiiba influenced the adoption of an arch design for what is the biggest, most difficult dam job now under way in Japan. Known as Kurobegawa No. 4, the dam will be 612 ft high, well up among the world's highest arches. The project is further notable as having what is probably the world's largest underground power plant in terms of excavated area. Counting only the power plant room, the excavation at Kemano in British Columbia is larger than at Kurobegawa, but Kurobegawa's switchyard and substation are also completely underground and a part of the same excavation, probably giving the Japanese installation first rank.

The powerhouse covers 25,300 sq ft, the substation 32,400 and the switchyard 36,800, or a total of 94,500 sq ft, well over two acres. And this does not take into account the access tunnels to these man-made caverns. All of this underground installation was necessary because of the 20 ft of snow that blankets the area in winter and because the steep sides of narrow Kurobe Gorge offered no suitable surface sites.

Kurobegawa No. 4 is a project of the Kansai Electric Power Co. The dam was designed by Electroconsult of Italy, and it is being constructed by Hazama-Gumi. It is located high up in the Japanese Alps on the Kurobe River, which flows north into the Japan Sea on a 1 to 40 average gradient, the steepest of any of the country's rivers. Favored with much water from melting snow, the river is completely developed with hydro plants. However, their total 240,000-kw capacity is reduced more than half during low stream flow periods.

The construction of Kurobegawa No. 4, with its large storage upstream, will remedy this situation and, in addition, will add its own 258,000 kw to the total capacity.

• Access a major problem—The desirability of a dam at the No. 4 site has long been recognized, but its extreme difficulty of access (nearly 5,000 ft elevation in rugged wild country visited only rarely, even by intrepid mountain climbers) and its high cost, were too much to overcome. Finally through an $80-million loan from the World Bank (which covers some other projects too) the company was able to undertake the construction. The total cost is estimated at $132 million.

Quite a few millions of dollars went into access roads before any construction could start. The nearest railhead is at Omachi, 12 miles away. A modern heavy-duty highway was built from there to the dam. The last five miles of the route is a tunnel big enough for a 22-ft roadway. A fault about 250 ft wide took the tunnelers six months to pass and pushed the cost of the five-mile tunnel up to $11 million.

Since there was no economical way of securing aggregates at the damsite, the necessary facilities were established at Omachi, on the bank of a river whose dry, boulder-filled bed provided a good and ample supply. The crushing and screening plant, modern in every respect, has a capacity of 700 tons of aggregate per hour, which it turns out in one fine and four coarse sizes. All of this aggregate is trucked seven miles to stockpiles at the mouth of the tunnel. From there it is carried the remaining five miles on a belt conveyor occupying one lane of the tunnel roadway.

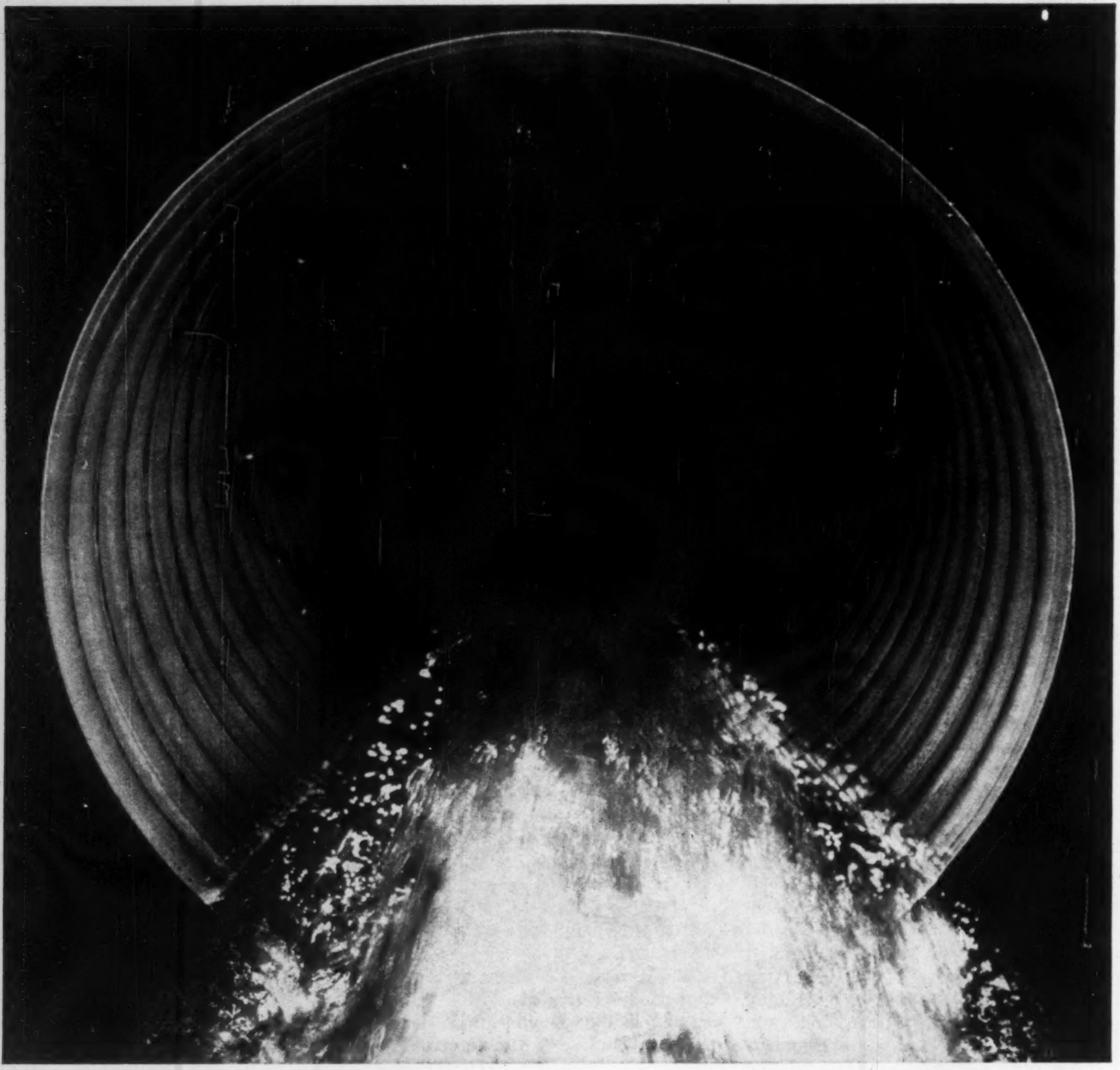
The 1.8 million cu yd of concrete required by the dam is being mixed in two plants set side by side high up on the right abutment downstream from the dam. One plant contains four 4-cu-yd mixers, the other, four 2-cu-yd mixers. Concrete is discharged into two-compartment transfer cars with a total capacity of 12 cu yd. These move it a short distance upstream to the loading platform for the cableway buckets. Four cableways of 1,975 ft span are used, two of 25-ton capacity, one of 10 tons and one of nine tons.

With this plant, 11,537 cu yd of concrete was recently placed in one day—a record for Japan and a big pour by any standard. It is nearly 70% higher than the record daily pour on Sakuma Dam, which was considered phenomenal in Japan when made.

• How high?—Kurobegawa Dam is now up to nearly two-thirds of its eventual height, and operations will soon be shut down for the winter. This does not mean that the engineers will be

(Story continues on p. 36)

NEW!! CULVERT OF



Strong protection against pipe failure!

Kaiser Aluminum & Chemical Sales, Inc.
Culvert Dept. Room 846, Kaiser Center
300 Lakeside Drive, Oakland 12, Calif.

Send me a copy of "Aluminum Culverts—Technical Information"—containing availabilities, uses, installation . . . suggested specifications.

NAME____________________

FIRM OR MUNICIPALITY____________________

ADDRESS____________________

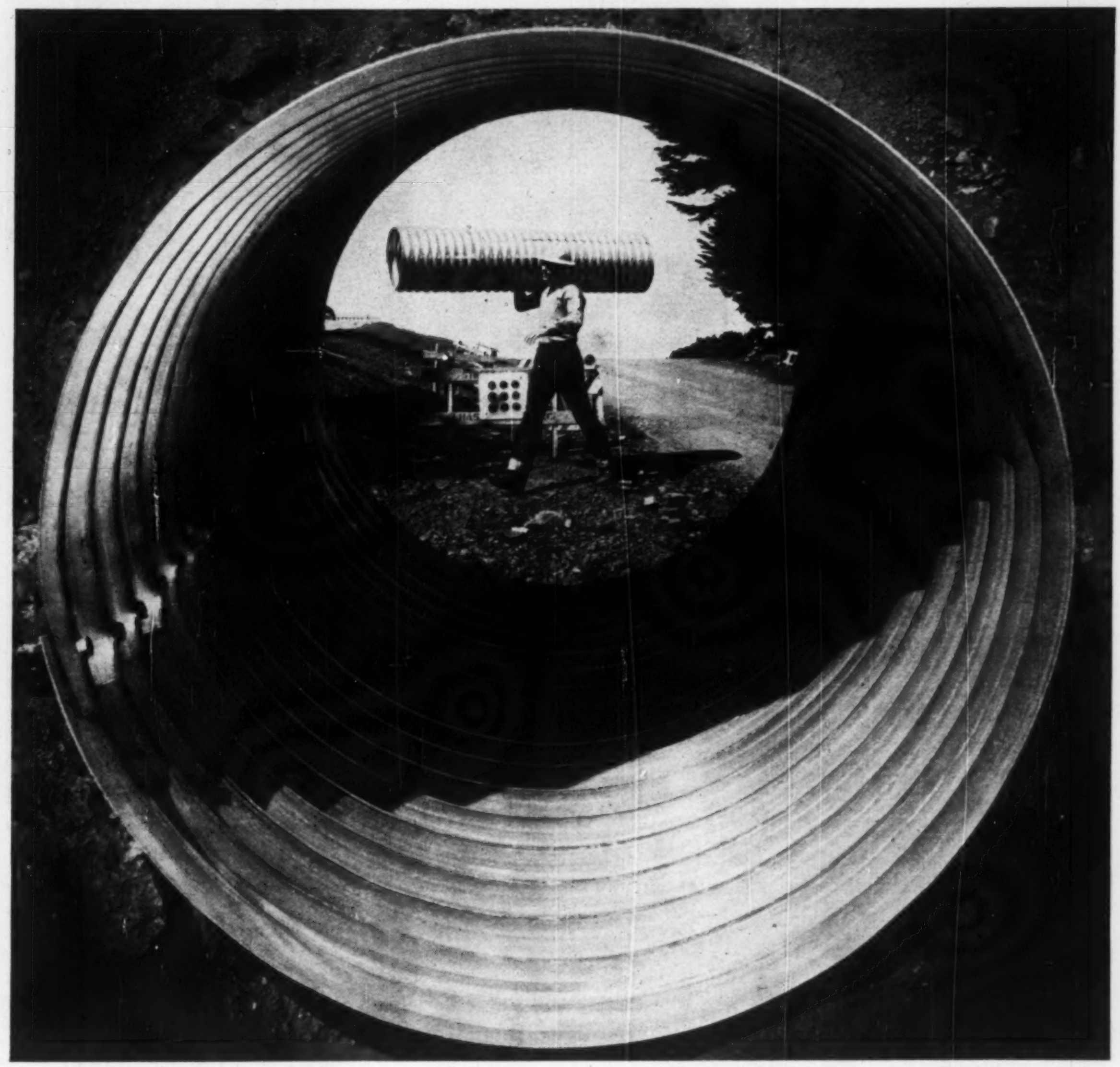
CITY__________ZONE____STATE________

Last year the first *all-aluminum corrugated culvert pipe* came into use in modern roads and highways!

The reason: the success of new Kaiser Aluminum Culvert Sheet—a special high-strength clad alloy based on ten years of severest soil corrosion testing.

The corrosion resistance of this new aluminum pipe is as thick as the metal itself. It is not endangered by everyday scrapes and runoff abrasion—conditions that chip off a galvanized coating and expose bare steel to rusting out. For any culvert load, fill limit, or safety factor you have normally specified for steel, there is now an aluminum pipe strength to meet your requirements. Independent tests show comparable installed pipe performance.

KAISER ALUMINUM!



Saves up to 20% in total job cost!

Since early 1960, contractors have reported savings up to 20% in total job cost because of the lower handling and installation costs of aluminum culvert.

Aluminum pipe *weighs less than one-third* as much as steel—160 pounds against 500 pounds in a typical 20′ x 24″ section.

This means that winch equipment is seldom needed for lifting. Aluminum pipe is loaded and positioned by hand, sawed to size almost like wood, and easily connected. A typical crew can install about 20% more of this new culvert per day.

For availability and complete technical information, use the coupon at left . . . or contact your nearest Kaiser Aluminum Sales Office listed in your telephone directory.

KAISER ALUMINUM

New leadership in the world of aluminum idle, however, for they are faced with a critical decision on how or whether the dam can be carried to its planned height in view of recently discovered deficiencies in the foundation rock high up on the abutments. An international consulting board, appointed by the World Bank to check the designs of a number of arch dams around the world on which the Bank has made loans, called attention to the poor rock and recommended either that the dam not be carried to full height or that modifications be made in the design to relieve the poor rock of most of the arch thrust.

The board also offered several modifications that could be made in the design of the upper part of the dam to produce a satisfactory full-height structure, but recommended that a decision be deferred until some large-scale tests of the rock in its natural state in the abutments are made and also until some further model tests are made. These will be carried out this winter.

Should the results of the studies indicate that the dam cannot be built to full height without modification, Kurobegawa Dam No. 4 may be a much more famous structure in the field of arch dams than it is even now. Any one of the modifications suggested by the consulting board would contribute quite special aspects to the upper portion of the structure.

It is understood that they include such things as: Accentuating the "plunging arch" or dome effect to reduce the thrust against the upper abutment; removing large quantities of the poor rock and replacing it with concrete if exploration should disclose good rock far back in the abutment; extending the arches as thrust blocks down to where sound rock exists; or even making use of prestressed cables carried to an anchorage in tunnels behind the abutments. It is clear that every effort will be made to find a safe way to carry the dam to its full height, because the extra storage and hydraulic head at stake are very valuable.

• Similar problems elsewhere — Other Japanese dams have also presented designers with foundation and access problems similar to those at Kurobegawa. One interesting solution, at Arimine, a gravity type dam on the Joganji River, was a bend in dam alignment to locate both abutments on good rock. The dam was begun in the late '30s, but work was abandoned during the war and for sometime thereafter. Original plans called for a height of 330 ft, but when Hokuriku Electric Power Co. took over the project and resumed construction in 1957, engineers redesigned the dam and raised the projected height to 430 ft.

TAGOKURA had to wait on a $7-million access job—a 20-mile railroad, 70 bridges, one of them 1,300 ft long, and six tunnels, including one a mile long.

They found, however, that if the dam were continued on the same alignment as the part that was already in place, it would run into faulted and weathered rock high up on the left abutment. They changed the alignment at about the quarter point of the length of the dam. The left end of the dam was also curved so that it could be better tied into the abutment rock.

As built, Arimine is 460 ft high and 1,650 ft long. It contains 2.1 million cu yd of concrete and backs up a reservoir of 170,000 acre-ft, which is used to regulate the river flow to the company's 11 downstream hydroplants. Maeda Construction Co. was the contractor.

Access was one of the main problems at two of EPDC's three big dams under construction now. These are the Tagokura and Okutadami dams on the Tadami River, a tributary of the Agano, which is one of the country's largest streams. Both are concrete gravity-type dams.

Tagokura, also being built by Maeda Construction Co., is 478 ft high, contains 2.6 million cu yd of concrete and includes a 380,000-kw power plant. Okutadami, 18 miles upstream, is 518 ft high, has a volume of 2.1 million cu yd and serves a 360,000 kw underground power plant some 430 ft lower than the base of the dam.

Okutadami reservoir will be Japan's largest, with an effective capacity of 368,000 acre ft. Kajima Construction Co. is building the dam and Taisei Construction Co., the underground powerhouse.

Both damsites were hard to reach. Before Tagokura could be started, a 20-mile heavy-duty railroad had to be constructed up the valley to the site. It required 70 bridges, including one 1,300 ft long, and six tunnels, one a mile long. The cost was nearly $7 million. At Okutadami it was necessary to construct a 20-mile access road through and across the mountains. One-half the length of this road had to be in tunnel.

The access facilities for these two dams have each had to carry more than

LOOK!

14 great new copy machines in the Ozalid®-Ozafax line!

Each one styled, sized, and priced to give you maximum efficiency for every office or plant need.

Got a preference in diazo reproduction equipment? Ozalid dry or Ozafax semi-dry (sometimes known as "moist")—take your choice from 14 brand-new models, rarin' to work for you.

In seconds, these machines make office and engineering reproductions you can hardly tell from originals. Save you time, work, money. Eliminate office copying errors, retyping, proofreading, double-checking. Increase print output, reduce reproduction costs. Paper cost? As little as 1¢ for a letter-sized copy.

Find out about the complete Ozalid-Ozafax line. Talk to an Ozalid salesman or write: Ozalid, Johnson City, N. Y. In Canada, Hughes-Owens Ltd., Montreal.

Ozalid for '61—boldest new look in the business!

500,000 tons of construction materials and equipment.

On both of these dams the size and scope of the construction equipment and plant are on the same order as at Kurobegawa No. 4. A concrete placement rate of over 8,000 cu yd a day has been continuously maintained. Here, too, the jobs must shut down in the winter because of deep snows. Fly ash is used in the concrete to cut down on the quantity of cement, and vinsol resin in used as an air-entraining agent. Aggregate is crushed from natural streambed deposits at Tagokura, but since similar deposits are not available at Okutadami all of its aggregate is produced in a granite quarry about two miles from the damsite.

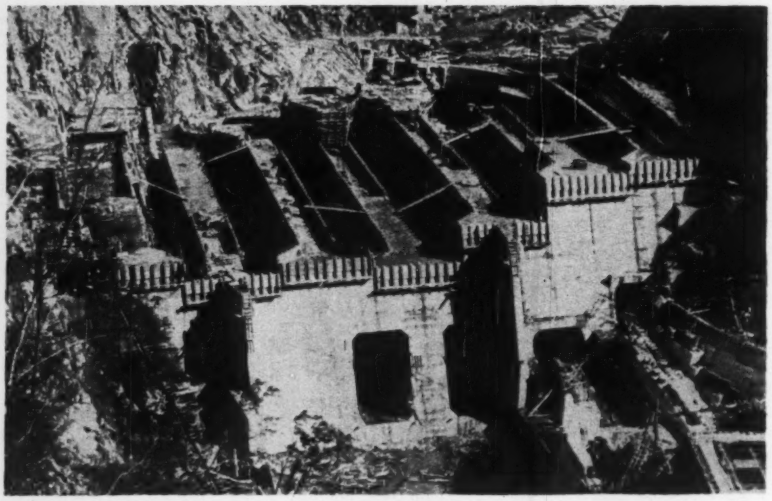
The third big dam under construction by EPDC is Japan's first rockfill, Miboro. Two factors influenced the decision to use rockfill: First, excellent granite and quartz porphyry is available at the site; second, a major fault in the right bank foundation made a concrete gravity design inadvisable.

Miboro's 432-ft height and 10.6-million-cu yd volume rank it among the world's foremost rockfill dams in both respects. Makio Dam, a second Japanese rockfill, is now under construction, but its size does not compare with Miboro's.

Miboro is of the sloping impervious core type. Since the available clay for the core was too high in water content as excavated, it was stockpiled and mixed with decomposed granite, which fortunately was found on the upper banks of the clay pit. The length of the haul from the clay pit to the dam was less than two miles, while the rock quarry was even closer.

Miboro, as well supplied with modern construction equipment as any U. S. rockfill operation, went forward smoothly after the fault in the right abutment had been grouted. This required first drilling a 200-ft.-deep shaft from which horizontal tunnels at three different levels were extended. From these tunnels over 50,000 ft of holes were drilled and the 100-ft-wide fault was injected with 1,100 tons of cement grout.

The underground power house, which will have a capacity of 215,000 kw, is also approaching completion, so that the $110-million project can go into service next year firming up power in the existing plants downstream on the Sho River.



IKAWA, completed after photo was made, successfully introduced hollow-buttress type to Japan. It is now being followed up with others.

• **Hollow dams**—One power company, Chubu, introduced the hollow gravity type concrete dam in Japan a few years ago, found it successful and is now building two more. Resembling a buttress dam with inclined faces both upstream and downstream, such dams have been used in Europe but have never found popularity in the U. S. The weight of water and accumulated silt on the upstream face contributes to their stability; and their reduced base area, compared to that of a solid gravity dam, reduces uplift. The reduced amount of concrete required is, of course, their main appeal.

These dams are on the upper reaches of the Ohi River. Ikawa, the completed one, is 340 ft high and contains 563,000 cu yd of concrete. Upstream from Ikawa, Hatanagi No. 1 and Hatanagi No. 2 are under construction. These two are principal parts of a pumped-storage power project. Hatanagi No. 1, the principal dam, will be 402 ft high and will contain 744,000 cu yd of concrete. The powerhouse will be under its spillway. Hatanagi No. 2 will be a much smaller structure downstream to create a small impoundment from which water can be pumped back into Hatanagi No. 1 reservoir by off-peak steam power at night.

Hatanagi's 10-mile access road typifies a fringe benefit that most of Japan's new dam jobs are contributing to the national economy. The hydro plant roads are about the only good ones in Japan's secondary highway system.

• **The future**—To witness Japanese dambuilding today is to realize that the country is capable of attaining equal rank in that field with any of the long-established dambuilding nations, and that in a number of respects she has already reached this level. Contractors have mastered the art of mechanized construction to an amazing degree, both in planning jobs and in training workmen to operate and maintain equipment. Equipment of Japanese manufacture duplicates the best to be found anywhere. Japanese engineers have high capability, but have no false pride in securing outside advice when they realize they need it. They are intrigued with anything that has proved successful elsewhere and will utilize more types of dams in the future than they have in the past.

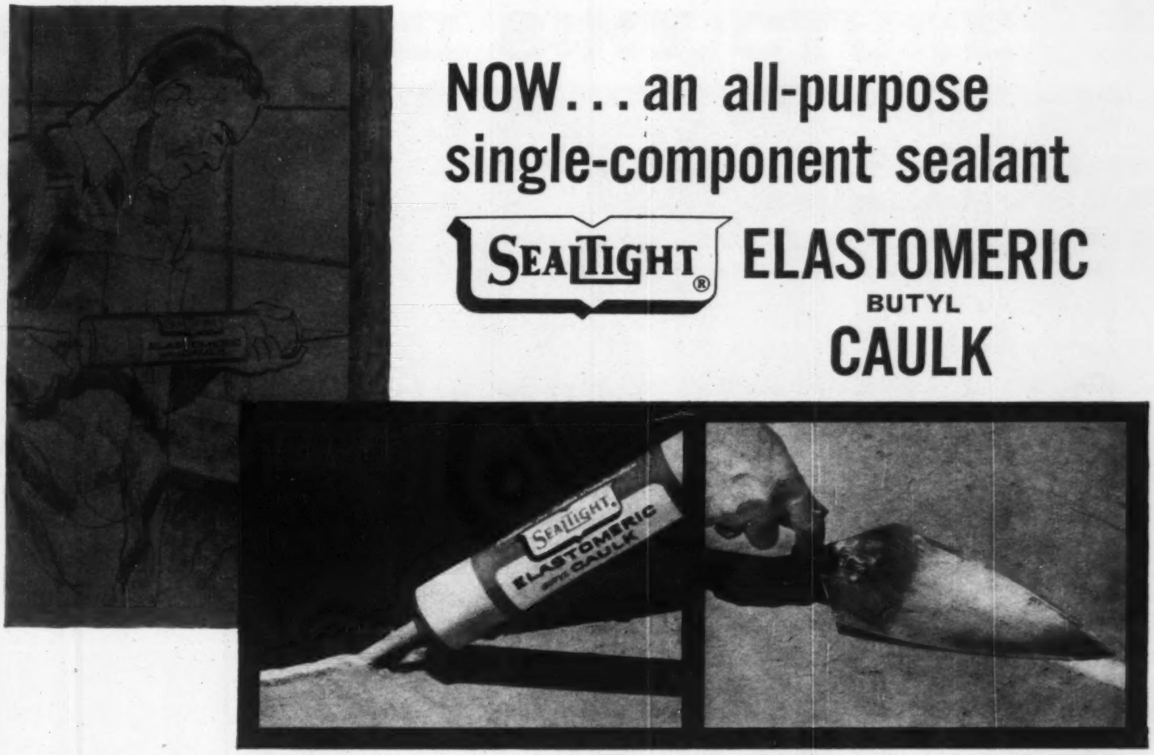
Japanese dambuilding for hydro power may have reached its peak — available sites are becoming too expensive for power development alone—but multi-purpose projects will keep dam construction at a reasonably high tempo. Both flood control and more irrigation water are badly needed, and dams to store the excess water from typhoon rains and the country's high snow melt can further these objectives.

Japanese industrial production and a large hard-working well-fed population will assure the country better than average prosperity, so that the cost of reasonable water resource development programs can be met. Japan is used to high interest rates so that borrowing money at world rates in foreign financial markets is never likely to be a deterrent. The country's credit and that of its electrical utilities with the World Bank is also good.

Finally, a significant point with respect to Japan's success in dambuilding is that her contractors and engineers are beginning to eye the possibilities for exporting their know-how. Japanese engineers have formed combines to solicit foreign assignments and have made a marked impression, particularly in Southeast Asia and Latin America. Contractors have been pressuring the government to help them get foreign work, citing the success of the West Germans as an example. In any event, Japanese technologists are already at work on projects in such countries as Laos, Burma, the Philippines, Java, Sumatra and Brazil. They are certain to try to extend these operations further.

NOW... an all-purpose single-component sealant

SEALTIGHT® ELASTOMERIC BUTYL CAULK



AVAILABLE IN GUN CARTRIDGES AND BULK CONTAINERS FOR TROWELING

ready to use . . . no on-site preparation . . . indefinite storage life

Modern construction products and techniques produced a demand for new caulking compounds. This need was successfully met with the development of two-component polysulfide liquid polymer sealants. Now the development of the new single-component Sealtight Elastomeric Butyl Caulk provides a sealant that offers most of the important qualities of the more costly two-component polysulfide sealants *plus* many additional advantages. It is a single-component material, pre-mixed and ready for use with no on-the-job preparation. Storage problems are also eliminated as Sealtight Elastomeric Caulk offers an indefinite shelf or storage life.

Sealtight Elastomeric Caulk provides an all-purpose sealant that is non-bleeding and non-staining. It can be used on any reasonably clean surface—porous or non-porous. It is virtually unaffected by freeze-thaw cycles; offers excellent resistance to oil, gasoline, ozone, and ultra-violet exposure and does not require a primer. Available in four colors: white, natural, gray and aluminum. Dries tack-free in four to six hours and cures in 30 to 60 days. Sealtight Elastomeric Caulk is ideal for sealing curtain wall joints, tuck-pointing masonry, caulking concrete, channel glazing and general caulking purposes.

SEALTIGHT
ELIMINATE MOISTURE PROBLEMS with

OTHER SEALTIGHT® PRODUCTS

• "PREMOULDED MEMBRANE" Vapor Seal • CM-60 Polysulfide Base Joint Sealing • Joint Sealing Compounds • Expansion joints of all types • Tongue and Groove Joints • "CORKTITE" Impermeable Perimeter Insulation • "HYDROMAT" Asphalt Liner • Sewer Joint Compounds • PVC Base Plates • Concrete Curing Compounds and many, many others •

• CATALOG NO. 100 . . . graphically describes and illustrates the Sealtight line of products used in construction of Highways, Pavements, Bridges, Airports and concrete structures of all types.

• CATALOG NO. 1660 . . . discusses need for a true vapor seal—provides positive proof as to how "Premoulded Membrane" fulfills this need. Illustrates product, its applications and installation data.

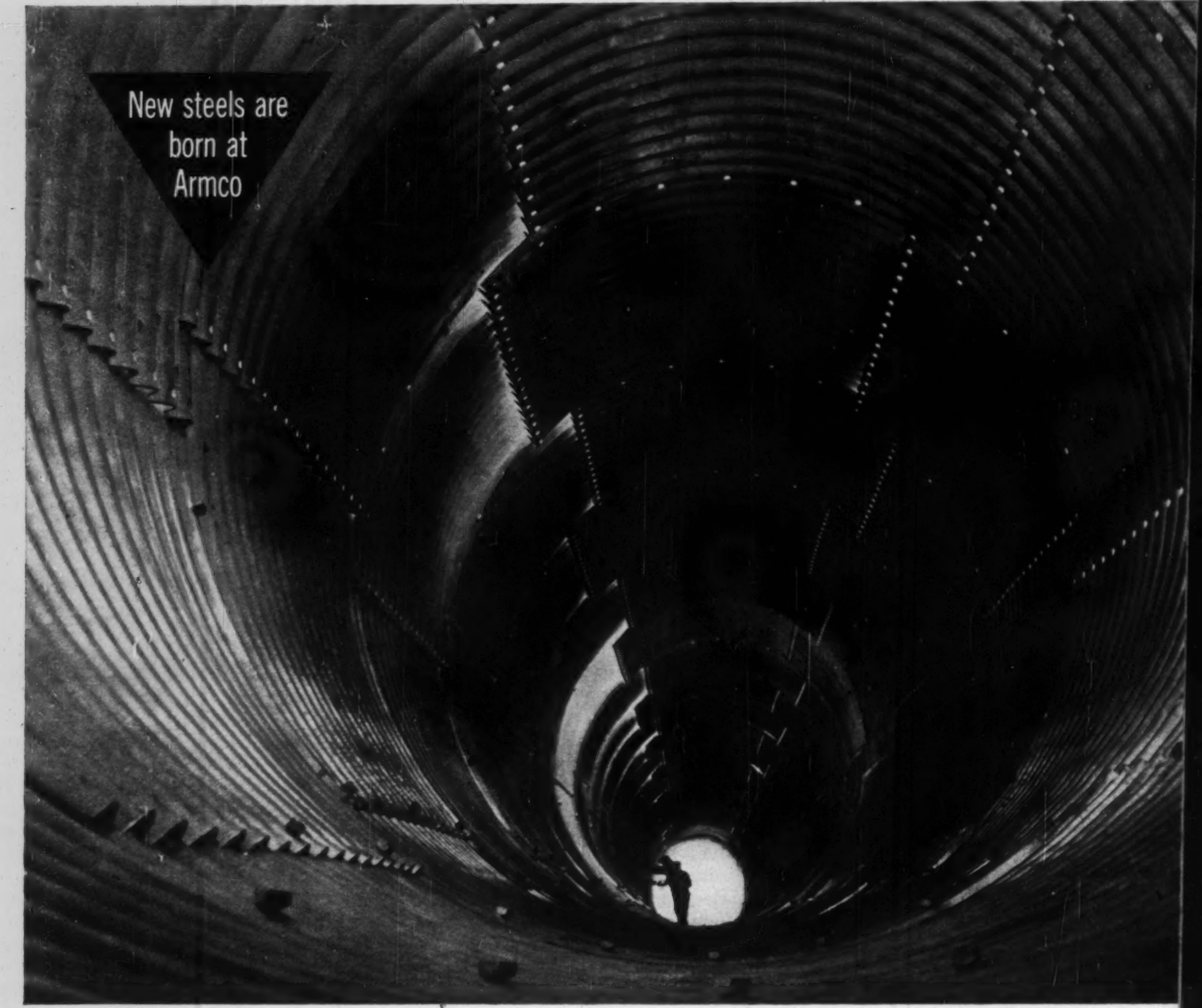
SEALTIGHT®
PRODUCTS
FOR BETTER
CONSTRUCTION

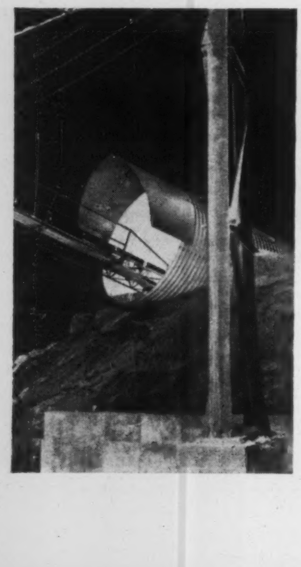
W. R. MEADOWS, INC.
16 KIMBALL ST. • ELGIN, ILLINOIS

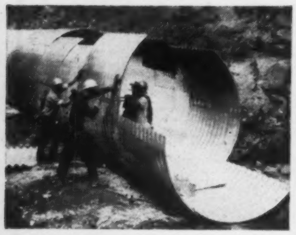
Please send, without obligation, the following:
☐ Information about Sealtight Elastomeric Caulk
☐ Catalog No. 100 ☐ Catalog No. 1660

NAME__________
FIRM__________
ADDRESS__________
CITY__________ STATE__________

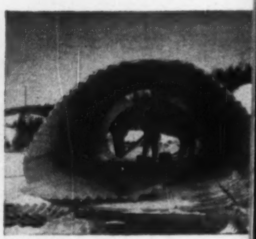
THIS BIG ARMCO




1


2

3


4

1. This conveyor tunnel is an Armco MULTI-PLATE Pipe. **2.** Easy-to-handle MULTI-PLATE sections are bolted together quickly. **3.** Battery of bituminous-coated MULTI-PLATE Structures provides large drainage area. **4.** Pipe-Arch is one of a variety of shapes of MULTI-PLATE Structures. **5.** MULTI-PLATE Pipe serves as pedestrian underpass in railroad yard.

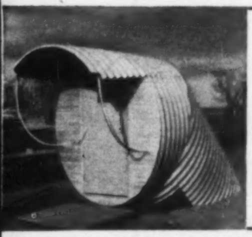
DRAINAGE STRUCTURE

won't crack or break

Properly installed, an Armco MULTI-PLATE® Drainage Structure functions as a *single unit*—for good. The curved, corrugated plates are bolted together to make an integral structure. Transverse earth pressures can't disjoint it. Frost action won't crack it. Imposed loads will not break it. This means an Armco Structure will be as strong, as straight and as sound 20, 30, 40 or more years from now as the day it was installed.

Best of all, Armco MULTI-PLATE is the *most economical* answer for large size drainage structures, underpasses, conduits and similar needs, time after time. Actual job service records prove it.

You can get complete facts easily. Use the coupon for your copy of the Armco MULTI-PLATE Catalog. If you want to discuss the application of MULTI-PLATE to your specific problem, our representative will be glad to show you factual case histories. Armco Drainage & Metal Products, Inc., 4320 Curtis Street, Middletown, Ohio.



Armco MULTI-PLATE Structures are part of a complete line of corrugated metal drainage structures offered by Armco. Others include Armco Corrugated Metal Pipe and Pipe-Arch, SMOOTH-FLO® Sewer Pipe, and Perforated Subdrainage Pipe. MULTI-PLATE is used where large openings are required. Diameters range from 60" to 180".

SEND FOR FREE CATALOG

TWENTY PAGES OF AUTHORITATIVE DATA

ARMCO
MULTI-PLATE

ARMCO DRAINAGE & METAL PRODUCTS, INC.
Department E
4320 Curtis Street, Middletown, Ohio

Rush my copy of the Armco MULTI-PLATE Catalog.
☐ Have representative call.

Name____________________

Title____________________

Organization____________________

Street or box number____________________

City________________ Zone______

State____________________

ARMCO DRAINAGE & METAL PRODUCTS

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company • The Armco International Corporation • Union Wire Rope Corporation

Loads Get Hefty As Banking Goes

Its designers wanted to use 7,000-psi concrete. San Francisco building officials held them to 6,000 psi. So columns in the new Bank of America building are heavily reinforced with rods and spirals—H-beams in the lower floors.

Reasons for the hefty columns: Heavy design loads for electronic computing and accounting equipment; wide spacing of columns for flexibility of floor space; and the desire to keep column sizes down.

All these factors combined to send column strength up.

Besides its high-strength columns, the new bank building has:

- The largest installation of infinite-access flooring ever made.
- Prestressed concrete curtain walls with a striking quartz-aggregate finish.

The eight-story structure is designed for ultimate expansion to 13 floors. Each floor has a gross area of 65,000 sq ft. The lower six floors are designed for 250-psf live loads, and all the rest will have 150-psf design loads.

• **High-strength columns**—The concrete columns were restricted to 36-in. dia. and spaced in 25 x 26-ft bays. To get the 6,000-psi strength, the final design mix (developed by Abbott A. Hanks, Inc., San Francisco Testing Laboratory) called for 10.4 sacks per cu yd. A water-reducing retarder was added to the mix to reduce cement content and to retard the development of heat of hydration in the massive columns to minimize possibility of cracking.

Concrete cylinders are being kept for future study when additional floors are to be added to the building. Tests have shown that the six-month strength of the concrete is in the 9,000 to 10,000-psi range.

Spread footings that hold the high-strength columns had to be 5,000-psi concrete to do their job. Actually, concrete designed for the columns was used in some of the footings to test mixing and placing procedures for the higher strength mix.

Floors carried on the columns are flat-slab construction, column caps and drop panels. Including the floor-to-floor height saving realized through use of flat-slabs, the designers figure the building roughly a million dollars cheaper than it might have been with a different floor system.

Floor slabs are 8½ in. thick for the 150-psf loading and 9½ in. thick for the 250-psf loading. Slab design called for 3,000-psi concrete.

Some resistance to seismic and other lateral forces is provided in the column-and-slab system, but most lateral-force resistance is in shear walls around the elevator and stair wells and in a solid wall along the back of the building.

• **Infinite-access floor**—The building has 129,000 sq ft of infinite-access flooring fabricated and installed by Weber Showcase & Fixture Co., Inc.

The flooring is 2 x 5-ft metal-edged panels of 1⅛-in. plywood covered with vinyl. The panels are supported on all four edges by steel-channel stringers held up from the floor slab by adjustable steel pedestals.

Any one of the panels can be removed for equipment installation purposes, and the underfloor space provides unlimited possibilities for mechanical or electrical installations.

The one-foot space between the slab and the plywood flooring is also used in this bank building as a return air plenum. Air to cool the electronic machines is drawn down through them, passes into the underfloor system and to a wall duct system.

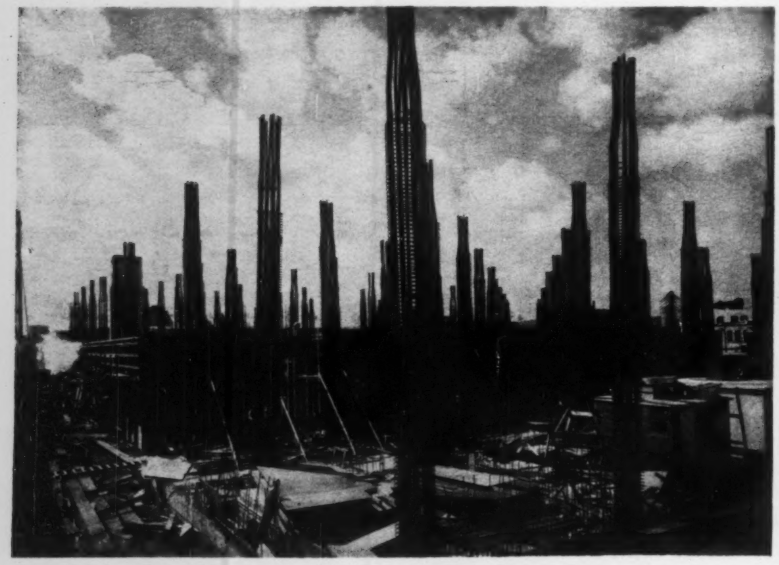
The building is completely air conditioned, not only for the occupants' comfort, but to provide the precise temperature and humidity control needed for the electronic equipment.

Normal floor-to-floor height of the building is 13½ ft. For the floors having the infinite-access installation, floor-to-floor height is 14½ ft.

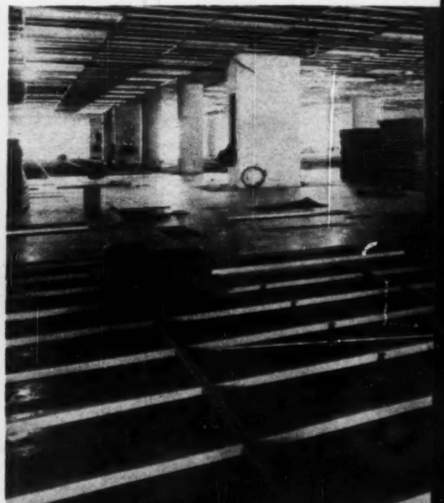
• **Prestressed curtain walls**—Vertical ribbons of windows alternate with concrete curtain-wall panels on three sides of the building. The curtain-wall installation is solid along the back wall and next to the stair wells. Even so, it has proven to be a relatively inexpensive exterior treatment.

Typical panels are 4-in. thick and about 10 x 13 ft in area.

They are prestressed in two directions with ⅜-in. steel strands of 210,000-psi ultimate strength. Prestress is limited to 120,000 psi. Horizontal cables are

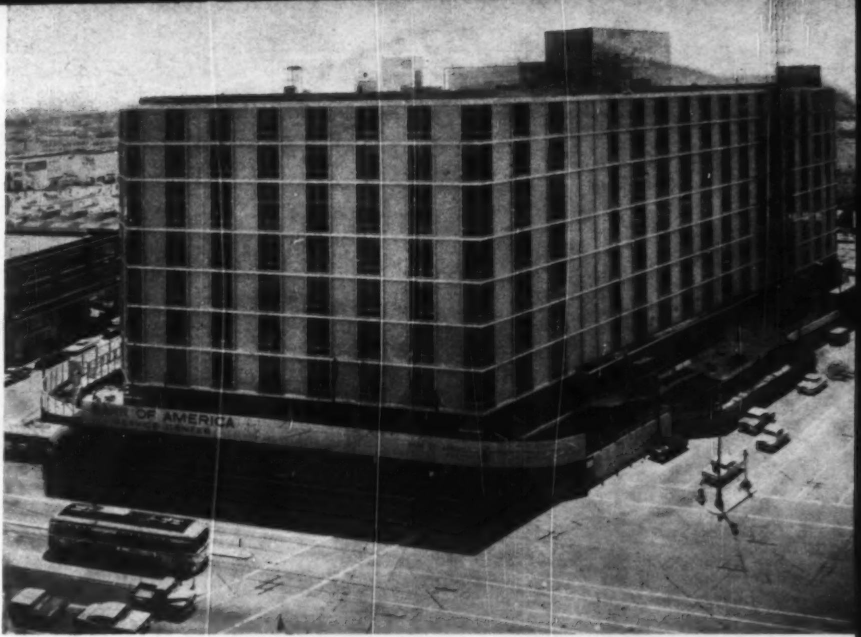


High-strength columns use heavy steel, 6,000-psi concrete.



Infinite-access flooring has space

Mechanical



Bank building houses heavy electronic accounting equipment.

8 in. c-c. Panel concrete is 4,000 psi.

Purpose of the two-way prestressing was partly to prevent cracking the panels during erection. Prestressing is also expected to maintain the panels crack-free, and thus leakproof, through the life of the building.

The panels along the back wall are increased in thickness to 6 in. because this is a firewall.

On the sixth floor, which houses mechanical equipment, 18-ft-high panels are used all around. In these, the vertical prestressing is spaced 5 in. c-c for the 4-in.-thick panels and 9 in. c-c for the 6-in.-thick panels.

Wall panels are connected at their bases to steel angles bolted to the floor slabs. A ½-in.-dia bolt, cast in the panel, fits in a 1-in.-dia hole in the angle. The detail at the top is a ½-in.-thick bent plate that fits over a plate bolted to the building spandrels. The panels are detailed to close tolerances.

The panels are sealed in the horizontal direction by aluminum flashing, which fits over a short "eyebrow" that includes the floor slab and the top part of the panel. Vertical seal is made by a polysulfide plastic compound injected into the gap, which is usually about ⅛ in. Panels are insulated, furred and plastered on the inside (thus the inside finish of the panels was not vital).

Four lifting inserts were cast in each panel for lifting it from its casting form. A pair of eyes cast into the top of each was used for hoisting.

The contractor originally planned on hoisting by truck crane at ground level, but he could not get his truck crane to the back wall of the building. He mounted a winch on the roof, and it worked so well that he used it to install almost all the panels.

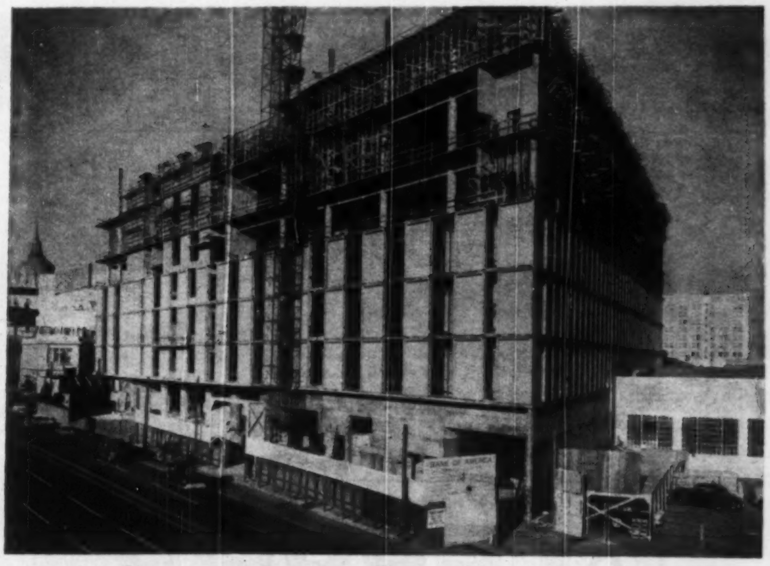
The building includes a moving-stair installation from ground level to the eighth floor, unusual in office-building construction. The moving stairs should handle the substantial floor-to-floor foot traffic efficiently. The pair of moving stairs is completely reversible for handling peak morning and evening traffic.

There is also an elevator installation that will be expanded when additional floors are added to the structure.

The building is designed for a roof heliport. This presented no structural problem, due to the design loading of 150-psi on the slab. The roof is not expected to be used for helicopter operations in the near future: Demand for such service has not yet developed in San Francisco; best operating practice requires a near-by emergency ground landing position, which is not available.

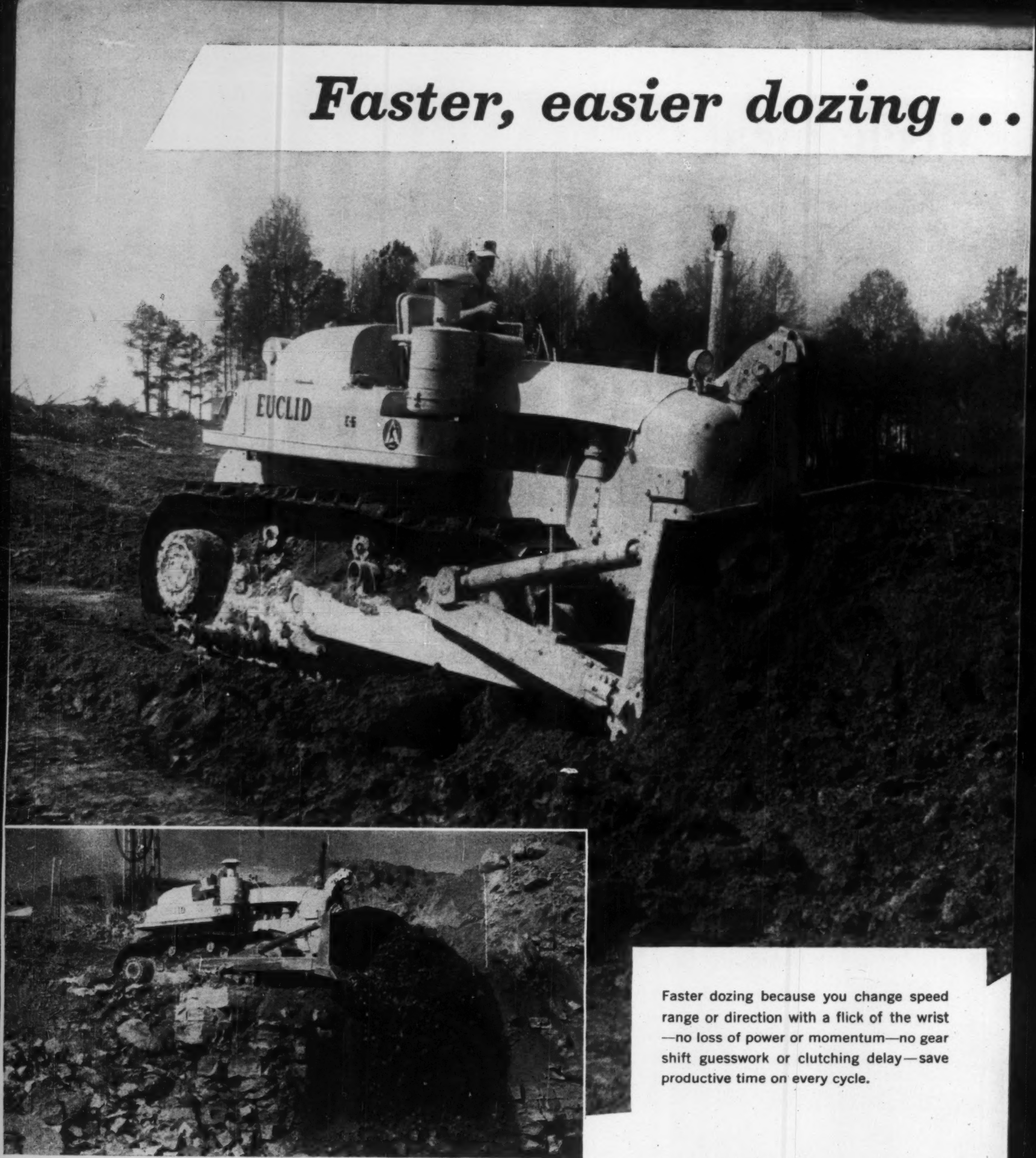
The building was completed for the Bank of America under the supervision of Continental Service Co. Wurster, Bernardi & Emmons was architect, Byron L. Nishkian did the structural design, and Gayner Engineers the electrical and mechanical design. Swinerton & Walberg Co. was general contractor. All are San Francisco firms.

beneath it for wiring, cooling.



Prestressed concrete curtain walls sparkle with exposed quartz.

Faster, easier dozing...



Faster dozing because you change speed range or direction with a flick of the wrist—no loss of power or momentum—no gear shift guesswork or clutching delay—save productive time on every cycle.

Full-power shift . . . fast-as-a-fox maneuverability

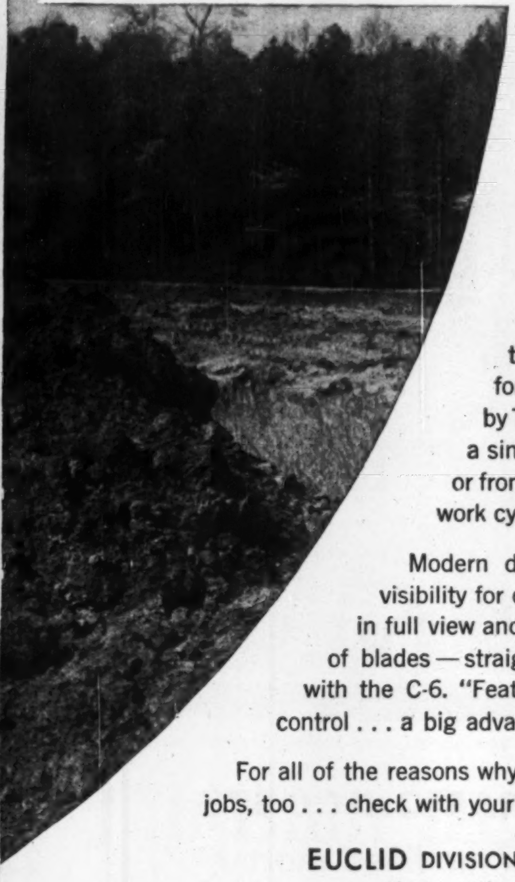
GM GENERAL MOTORS EUCLID

EUCLID

FOR MOVING EARTH, ROCK, COAL AND ORE

. . and overall work-ability

put the "EUC" C-6 in a class by itself!



No matter what your dozing requirements may be—from small grading work for land improvement, plant sites or secondary road construction to the big yardage projects—the new Model C-6 Euclid Crawler offers the best return on your equipment investment.

The C-6 has proved its ability to "doze circles" around other tractors in the 200 h.p. class on job after job. One of the reasons for this outstanding performance is the full-power shift provided by Torqmatic Drive. There's no time lost in clutching and shifting . . . a simple flick of the wrist changes from one speed range to another, or from forward to reverse and back again. You save seconds on every work cycle . . . keep power matched to the load and job conditions.

Modern design, with rear-mounted radiator, gives the operator better visibility for dozing. The blade is close to the front of the tractor where it is in full view and provides good balance and stability. There is a complete line of blades—straight, angle and "U"—engineered for top dozing performance with the C-6. "Feathered steering" results in smooth turning and positive track control . . . a big advantage on difficult slope work.

For all of the reasons why the C-6 has more work-ability on dozing . . . and other crawler jobs, too . . . check with your Euclid dealer for performance facts and figures.

EUCLID DIVISION OF GENERAL MOTORS • CLEVELAND 17, OHIO
Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland

Good balance with heavy dozer attachments . . . rear-mounted radiator permits close mounting of straight, angle or "U" blade at front and provides excellent visibility for operator. Quick shift permits "rocking" the tractor to get under big boulders, stumps, etc. Power, speed and fast maneuverability, combined with a rugged undercarriage that stands up under heaviest service, make the C-6 a top performer.

Torqmatic Drive...211 net h.p....easy service accessability

DOW | **MATERIALS FOR MAINTENANCE**

CUT RESURFACING PREPARATION COSTS

. . . renew bridge decks with latex modified mortar

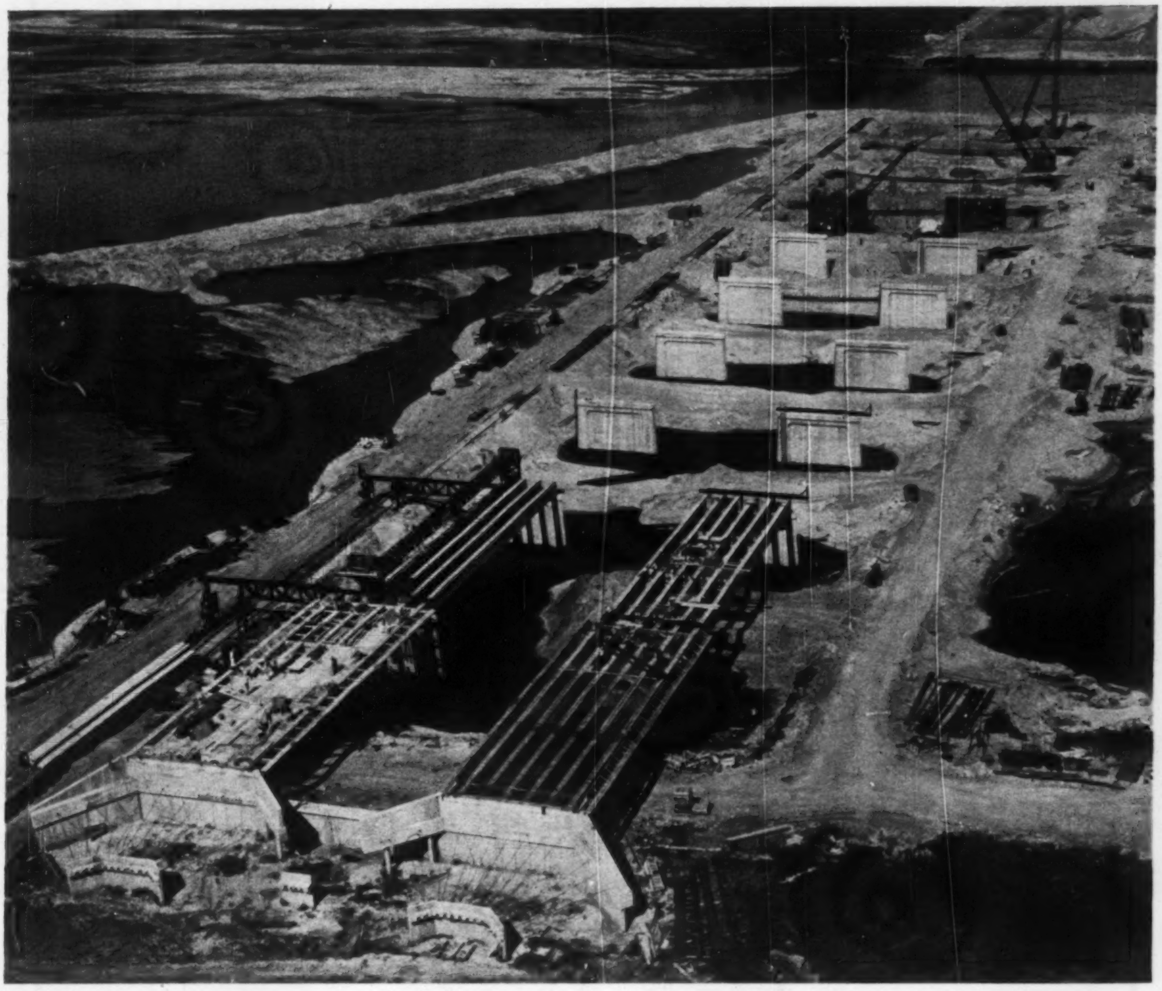
Here's how you can prepare and resurface structural concrete bridge decks in less time and at lower cost using portland cement mortar modified with Dow Latex 560.

Compare these savings. Conventional resurfacing methods require that you jackhammer out at least three to four inches of old concrete across the entire surface of the bridge and lay three to four inches of new concrete.

But when you're resurfacing with latex modified portland cement mortar, *only* the areas of actual failure need be jackhammered and sandblasted – and then only to a minimum depth of ½ inch, or to a depth sufficient to expose a sound concrete base. This thin layer of latex modified portland cement mortar has greater adhesion to substrate and produces a surface with greater flexural, tensile, compressive strength, greater resistance to water penetration, and higher freeze-thaw resistance than conventional concrete or asphalt resurfacing! It conforms to the expansion-contraction cycle of the original concrete, and reduces stress on the new surface.

Highway engineers, working with Dow research, have made field placements of latex modified mortar on bridges in Michigan, New York, Vermont, Texas, Ohio and several other states. For full information write for a technical report on how to apply latex modified portland cement mortar on structural concrete bridges and highways: THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department 1958LQ12-8.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN



Piers for twin bridges march across the Platte River in double file as . . .

Job-Built Rig Places Big Beams

An ingenious contractor-built gantry is the key machine in installation of prestressed concrete beams for twin bridges under construction across the Platte River near Ashland, Neb. (ENR Sept. 29, p. 34).

Beams are shipped by rail about 35 miles from the producer's casting yard to the bridge site. At the site, the contractor (Massman Construction Co. of Kansas City) built a spur railroad on a dike that parallels the double line of piers on the upstream side.

The beams are carried on flatcars alongside the piers on which they are to rest. Each car carries two beams. Six beams span each pair of piers, or 12 per span for the double structure.

Structural heart of the gantry is the 3-ft-square mast section of a stiff-leg derrick. The rig is 112 ft 4¾ in. long from rail to rail, sufficient to span a pair of piers.

An operating platform and the hoisting unit are at one end of the rig. The machine has a torque converter hoist with a double drum working off a single shaft; lead line pull is 20,000 lb. Two niggerhead drums are used to move the crane back and forth. The gantry is rigged with falls at either end, set 105 ft between blocks; there are seven parts of line to each block. The line to the tackle closest to the hoist passes through a gate block at the gantry's midpoint and then back, to maintain distance and an even hoisting rate on the two lifting assemblies.

Because the rails on which the gantry rides are set at different levels, the ends are of unequal height. The 7-ft-high control end rides on a railroad rail set on top of the concrete beams of the preceding span. Rail for the other end is mounted on the pier; height of the gantry there is 12 ft 6 in.

Each of the rails spans a distance of about 163 ft from the outside of the downstream pier to the rail tracks on the dike.

The two segments of rail that traverse the piers are welded to 12WF45 steel beams of corresponding length. At the hoist end, holes cut in strap plates welded to the lower flange of the steel beam fit over bolts set in the concrete beams for the expansion joint. At the outboard end, similar holes fit over anchor bolts in the pier.

Between the piers—a distance of 56

Wherever Engineered Construction is Required . . .

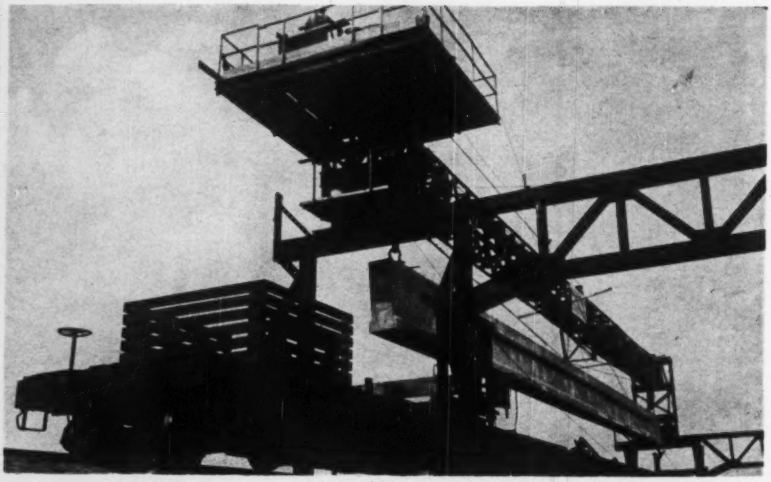
HARBERT CONSTRUCTION CORPORATION
BIRMINGHAM, ALABAMA

WATER WORRIES?

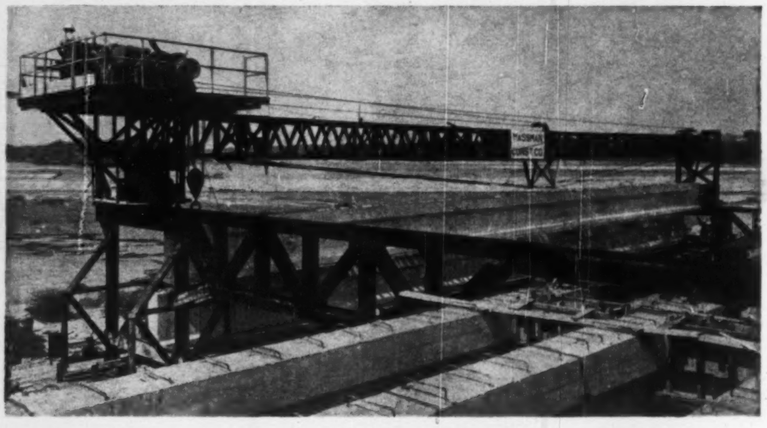
Let water specialists bring you back to dry land. Specify

John W. STANG

Corporation • Los Angeles • Omaha • Tacoma • St. Petersburg



Legs of gantry towers straddle railroad tracks on dike.



Truss and beams support rails on which gantry travels.

ft—and over the 28-ft gap from the upstream pier to the tracks on the dike, the gantry rail is supported by steel trusses. Fabricated from excess material in Massman's yard, the interior truss is built up of pieces of 21WF beams and the outboard truss of 14WF stock. The beam and truss assemblies bolt together to support the full length of rail.

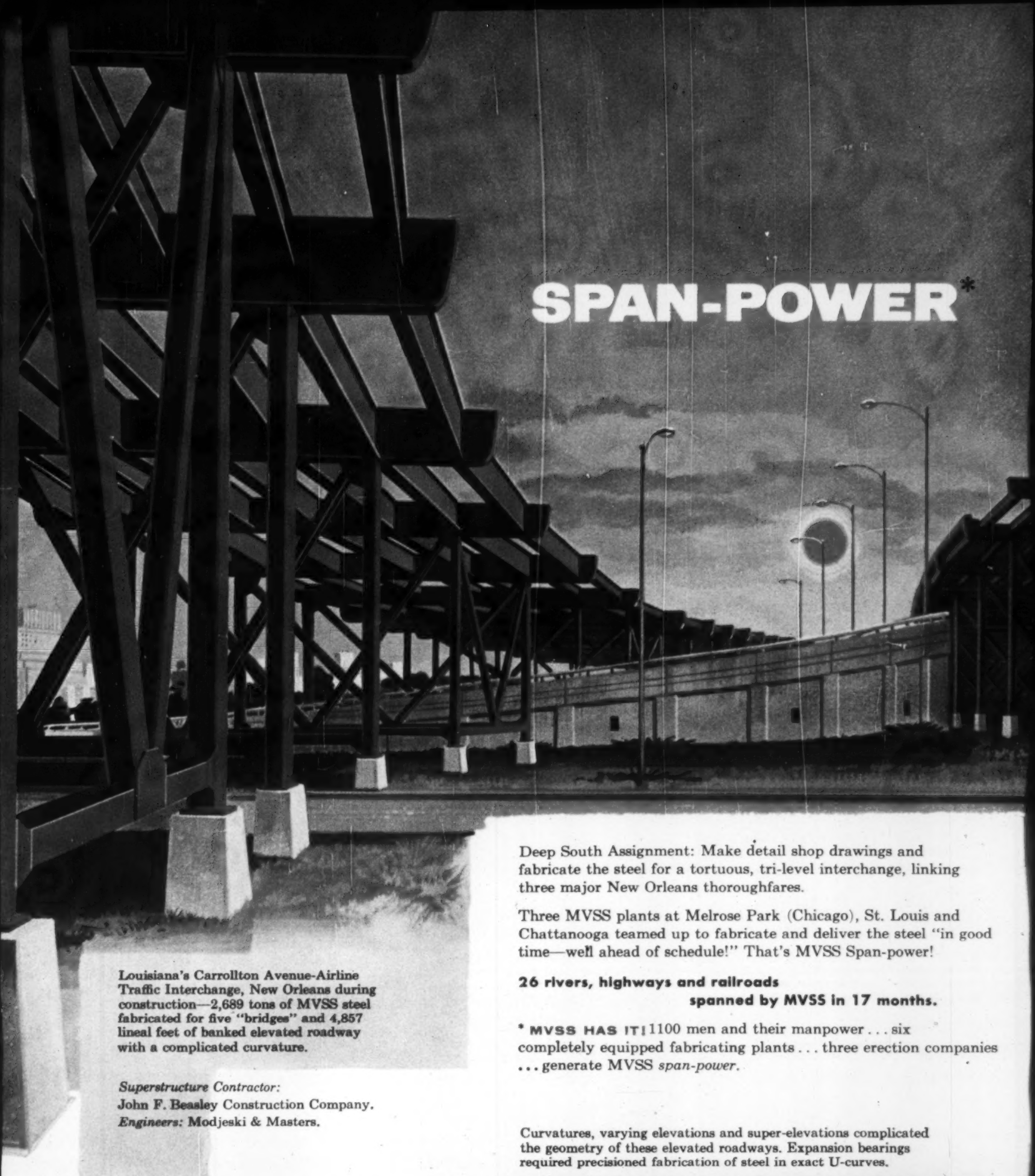
The two outboard trusses tie into towers set on the dike over the railroad track. Each tower has four legs made of 5-in. extra strong pipe. The legs straddle the track so that a railroad car carrying the concrete beams can be run beneath the towers. Rails on top of the towers are extensions of those carried by the trusses. The gantry can roll on to the towers, pick a beam off the flatcar, hoist and carry the beam to its position on either pier, and lower the beam into place.

Hinged jacks that swing inboard are mounted on the lower sections of the tower legs. They are used to move the gentry to another position. The crane is run onto the towers and the jacks swung in to engage the deck of a flatcar below. The entire assembly is jacked up until the tower legs clear the ground and the flatcars pulled forward with a crawler tractor until the gantry is in place opposite another pair of piers.

The gantry rail and truss units are disassembled and moved to the next pier by mobile crane. Breaking the assembly down, moving it to a new location and reassembling takes one day.

Thirteen pairs of reinforced concrete piers founded on prestressed concrete piles support the twin structures. Piles are driven and piers built "in the dry" because of the contractor's dikes and wellpoints installed by the dewatering subcontractor, John W. Stang Corp.

Five twin pier sites are dewatered at one time by 12- and 16-in. wellpoint pumps with a total capacity of 35,000 gpm. The system incorporates a large number of valves for flexibility. Pumps are located at the critical position on each ring of wellpoints surrounding one twin pier site. As each set of piers is completed, the corresponding ring of wellpoints is "leap-frogged" ahead without shutting down any of the four remaining wellpoint rings.



SPAN-POWER*

Louisiana's Carrollton Avenue-Airline Traffic Interchange, New Orleans during construction—2,689 tons of MVSS steel fabricated for five "bridges" and 4,857 lineal feet of banked elevated roadway with a complicated curvature.

Superstructure Contractor:
John F. Beasley Construction Company.
Engineers: Modjeski & Masters.

Deep South Assignment: Make detail shop drawings and fabricate the steel for a tortuous, tri-level interchange, linking three major New Orleans thoroughfares.

Three MVSS plants at Melrose Park (Chicago), St. Louis and Chattanooga teamed up to fabricate and deliver the steel "in good time—well ahead of schedule!" That's MVSS Span-power!

26 rivers, highways and railroads spanned by MVSS in 17 months.

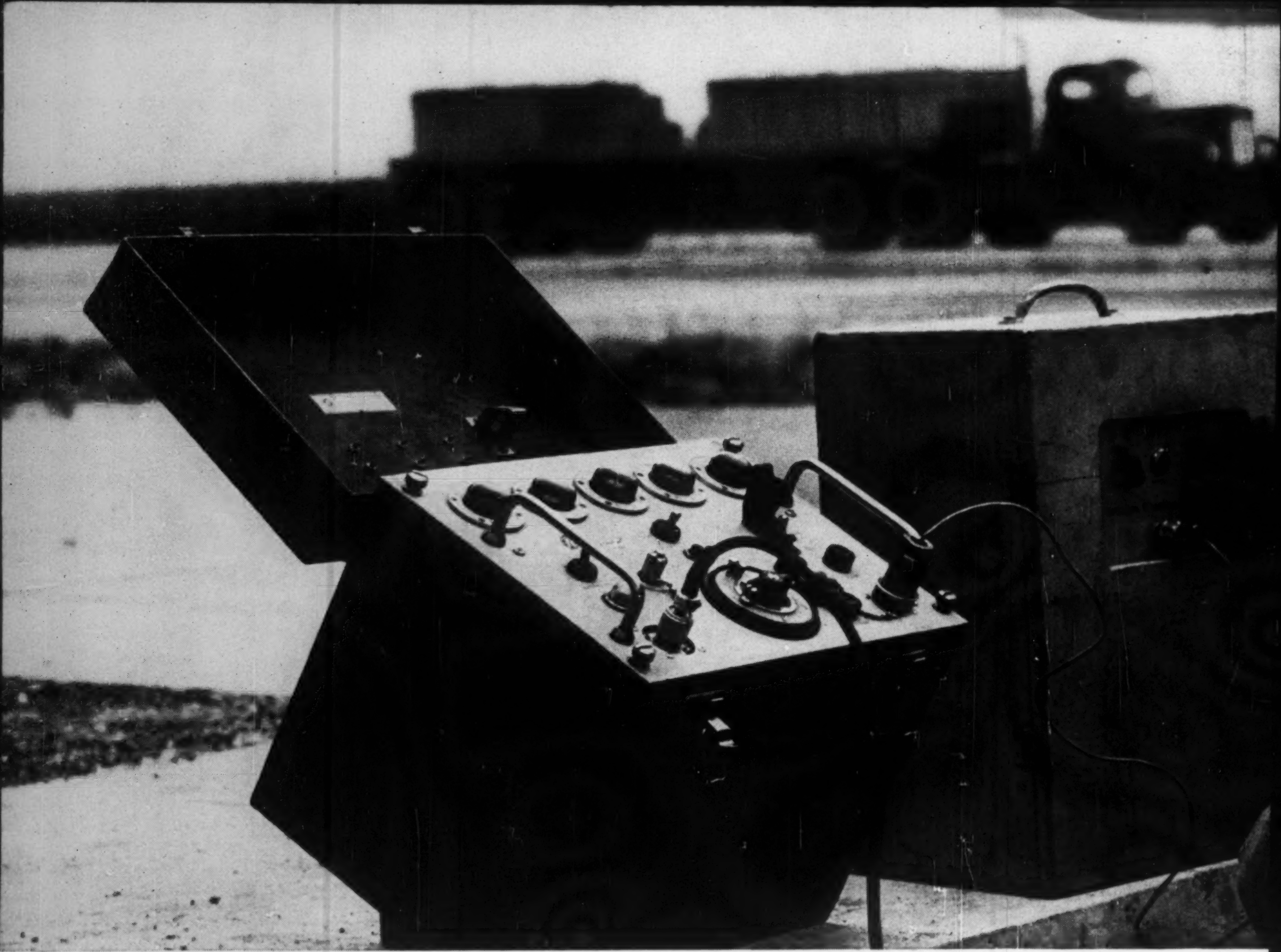
*** MVSS HAS IT!** 1100 men and their manpower . . . six completely equipped fabricating plants . . . three erection companies . . . generate MVSS *span-power*.

Curvatures, varying elevations and super-elevations complicated the geometry of these elevated roadways. Expansion bearings required precisioned fabrication of steel in exact U-curves.

MISSISSIPPI VALLEY
STRUCTURAL STEEL COMPANY
MV SS SERVICE

Six Strategic Plants. Chicago (Melrose Park) • St. Louis, Mo.
Flint, Michigan • Lansing, Michigan • Decatur, Ill. • Chattanooga, Tenn.

© 1960 MVSS CO., Decatur, Illinois



Nuclear physics is the basis of gamma ray equipment used to measure sub-surface densities

Scientific readings by the ...recorded in the

Sponsored by the American Association of State Highway Officials (AASHO), this 27-million-dollar test will provide "statistically unassailable" facts on modern pavement design.

On November 30th traffic ended on five test loops at Ottawa, Illinois. 17 million miles of travel have been marked up. Vital data have been pouring in, useful new facts on pavement performance are evident.

The entire National Road Test project is the most scientific experiment ever carried out on highway pavements. Modern statistical techniques for test section layout assure the total reliability and impartiality of findings. The newest in instrumentation, recording and automatic data processing equipment are providing a tremendous volume of data—free from human reading and transcription error.

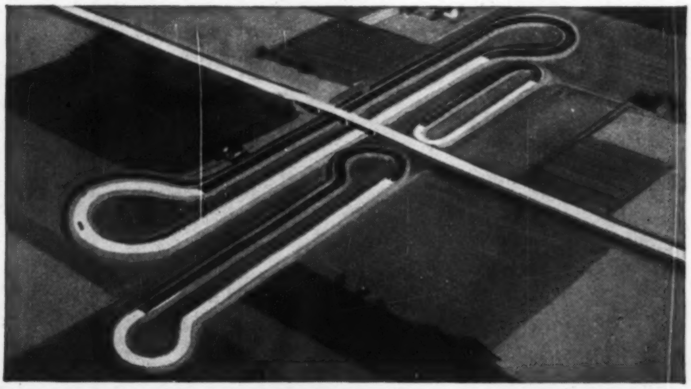
Electronic computers, of course, play a major role in data analysis. Some 100 programs have been written for the computers—so complicated that as much as 2 weeks were needed to set up a single program.

The final result—a storehouse of engineering information, the conclusive facts needed by every engineer, official and legislator to plan and build the most practical, efficient road system possible.

For Interstate highways, roads and streets of all classes, the National Road Test will prove the most significant test of pavement types of all time.

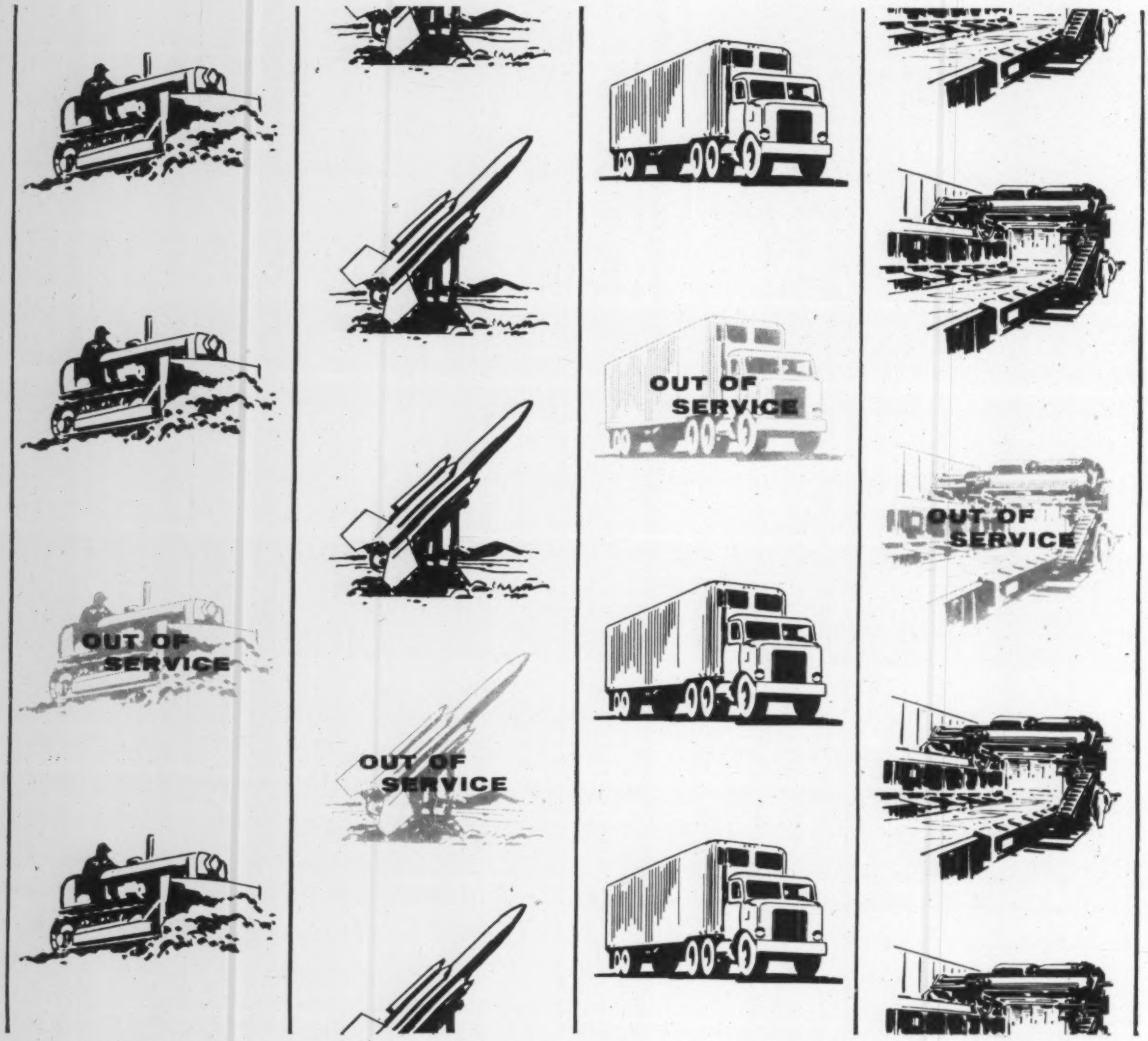
PORTLAND CEMENT ASSOCIATION *A national organization to improve and extend the uses of concrete*

hundreds of millions National Road Test!



836 test sections—repeating nearly 200 different pavement combinations make up five loops. Over 1,100,000 load applications have been recorded.

The National Road Test is sponsored by the American Association of State Highway Officials.
Represented on the National Advisory Committee: American Association of State Highway Officials, American Automobile Association, American Trucking Associations, Inc., Asphalt Institute, Automobile Manufacturers Association, Automotive Safety Foundation, Bureau of Public Roads, Department of the Army, Highway Research Board, National Highway Users Conference, Portland Cement Association, Truck Trailer Manufacturers Association; the petroleum industry, state highway departments, the tire industry and universities.
Administered and directed by the Highway Research Board of the National Academy of Sciences—National Research Council.
Operated by a staff of engineering and technical specialists.



Dependable ROLLWAY BEARINGS help keep your down-time low

When a bearing "goes", your machine stops.

That's why it pays to call in Rollway. Especially when reliability is a must.

At Rollway, you can choose from a wide selection of sizes and types with maximum capacities . . . for normal, low or high temperature operation. All meeting or exceeding RBEC requisites in Classes 1 to 5.

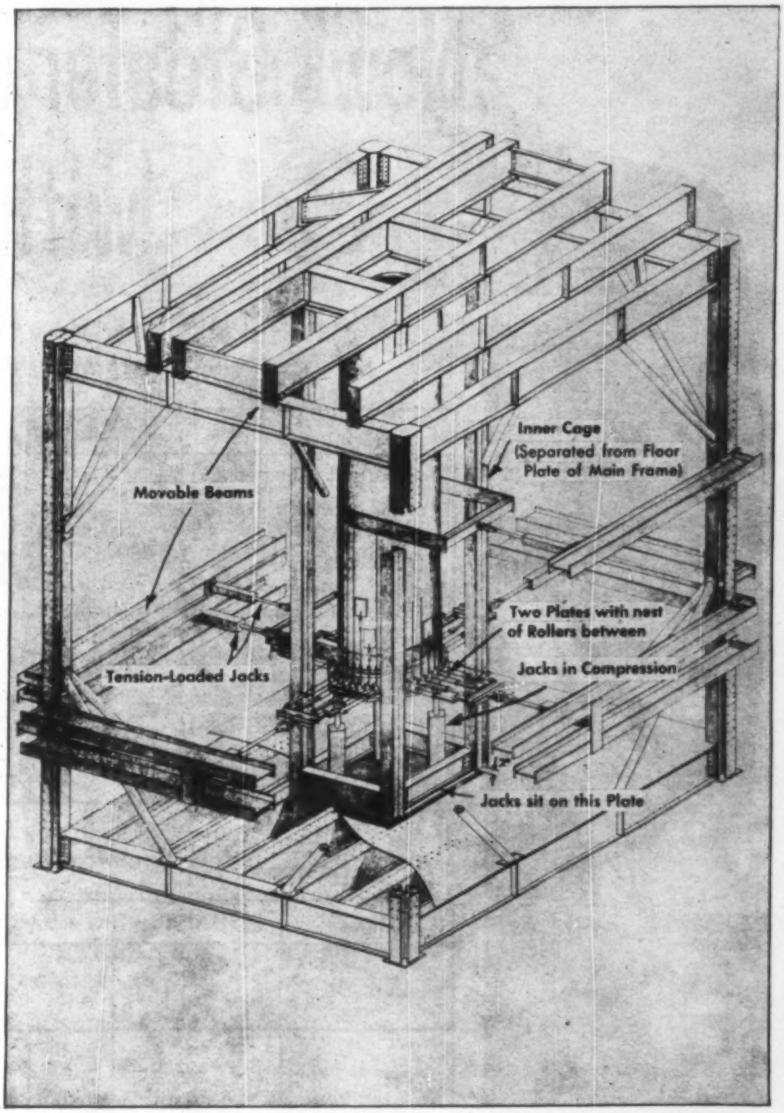
You'll find that Rollway meets your needs exactly – in commercial grade, precision, or ultra-precision bearings. To get the bearing you want in a hurry, or to start R and D on the bearing you've been dreaming about, just call or write Rollway Bearing Company, Inc., Syracuse 1, New York.

Where So Much Depends
on So Little . . .
You can depend on

ROLLWAY
BEARINGS
Radial and Thrust Cylindrical Roller Bearings

ENGINEERING OFFICES: Syracuse • Boston • Chicago • Detroit • Toronto • Pittsburgh • Cleveland • Seattle • Houston • Philadelphia • Los Angeles • San Francisco

‘Missile Mauler’ Tests the Polaris


Inner Cage (Separated from Floor Plate of Main Frame)
Movable Beams
Two Plates with nest of Rollers between
Tension-Loaded Jacks
Jacks in Compression
Jacks sit on this Plate

Missile suffers all the pains of flight without leaving test rack.

The frame pictured at right is a kind of torture chamber for the power plant of the Polaris missile. Its job: to impose test loads on the power plant equal to the various loads it will encounter during the ejection and flight of the Navy's submarine bird.

It's called a “missile mauler” by the structural engineers who designed it, a “static testing stand” by those less intimately involved. The frame is now in operation at the Aerojet-General plant near Sacramento, Calif. (ENR July 7, p. 38).

The main-frame columns are 21 ft c-c; clear height from base to top of main-frame girders is 28 ft. There are four movable beams on top of the frame; two of them support an inner cage. The cage hangs free—neither columns nor bottom plate contact the base of the main frame. However, lateral movement of the columns is prevented at the base.

The missile's two-stage power plant is suspended from the top plate of the cage.

The frame reproduces these loads imposed on the missile:

- Compressive thrust caused by air pressure when the missile is ejected from a submarine. This load is applied by four jacks seated on the bottom plate of the cage.
- Effects of inertia, friction and gravity. These are represented by skin pads fastened to the surface of the unit. The force on these pads is equalized by a system of cables and pulleys. Load is applied to this system by jacks mounted on movable side beams fastened to the columns of the main frame.
- Forces in handling and transporting the missile and forces caused by a change of direction in flight. These forces are applied through collars girdling the unit.

The main frame is designed to resist movable loads along top and bottom girders and along the columns. These movable loads vary in location and amount. They are simultaneously applied to the frame in varying combinations.

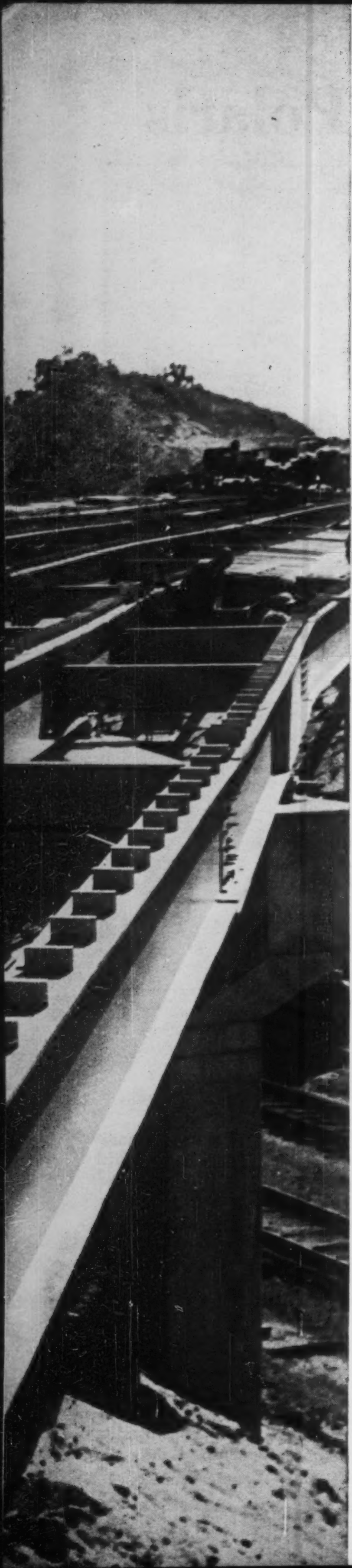
The design procedure consisted of first writing a series of equations describing the relative displacement of all knee joints of the frame as a whole under each load condition. This was done a second time to include the effect of side sway.

Next step was to consider the top girder alone. Pinned ends were assumed as well as springs in lieu of the knee braces. A series of relative displacement equations were written for the deflection at the springs for actual loads moving along the top beam. This was followed by the solution of simultaneous equations from these general conditions. This gave the stress in the knee braces and led, in turn, to the design of all members.

Interesting features of design include the main-frame columns, which consist of pairs of wide-flange members cut and welded together to form columns equally stiff in both directions. Members are joined with high-strength bolts. The design of the connection takes advantage of the high tensile strength of the bolts as well as their shear strength. The gage of bolt holes in columns, beams, jack bases and fittings is constant so that all top and side beams are interchangeable and can be used on any side or on top of the frame in either direction.

In anticipation of oil leaking from the jacks on the steel base plate of the main frame, this plate was covered with an adhesive and carborundum particles were sprinkled over it to form a nonskid surface.

The structure was designed by Earl W. Gerharter, structural engineer, of the firm of LeRoy F. Greene, consulting engineers, and fabricated and erected by Palm Iron and Bridge Works—all of Sacramento, Calif.



Now! Greater economy for
with new A36

Mechanical Properties

	A7	**A373**	**A36**
Yield Point, min. psi	33,000	32,000	36,000
Tensile Strength, psi: For shapes of all thicknesses	60,000 to 75,000	58,000 to 75,000	60,000 to 80,000
For plates and bars. Up to 1½ in., incl., in thickness	60,000 to 72,000		
For plates and bars over 1½ in., in thickness	60,000 to 75,000		
Elongation in 8 in., min., per cent	21	21	20
Elongation in 2 in., min., per cent	24	24	23

Chemical Requirements

	SHAPES		BARS		PLATES			
A7 C max	...		...		...			
A7 Mn	...		...		...			
A7 Si	...		...		...			
			¾ in. & under	Over ¾ in. to 4 in.	¾ in. & under	Over ¾ in. to 1½ in.	Over 1½ in. to 4 in.	
A36 C max	.28		.28	.28	.28	.28	.28	
A36 Mn	...		...	.60/.90	...	.80/1.10	.85/1.20	
A36 Si	...		...	...	...	...	.15/.30	
	Other than Group A	Group A heavy W.F.	1 in. & under	Over 1 in. to 4 in.	½ in. & under	Over ½ in. to 1 in.	Over 1 in. to 2 in.	Over 2 in. to 4 in.
A373 C max	.28	.28	.28	.28	.26	.25	.26	.27
A373 Mn	...	.50/.90	...	.50/.90	...	.50/.90	.50/.90	.50/.90
A373 Si	...	...	...	...	...	...	.15/.30	.15/.30

BETHLEHEM STEEL

steel bridges and buildings
structural steel!

for strength
. . . economy
. . . versatility

- ***Adopted by the ASTM on June 16, 1960***
- ***Approved by the Bureau of Public Roads***
- ***Recognized by the A.I.S.C.***

ASTM Specification A36 covers carbon steel shapes, plates, and bars of structural quality not over 4 in. in thickness for use in the construction of bridges and buildings, and for general structural purposes.

10 PER CENT STRONGER THAN A7 AND A373

A36 has an increased yield point of 36,000 psi, and is approximately 10 per cent stronger than A7 and A373. The higher yield point of A36 allows increased design stresses using the same factors of safety.

WELDABILITY IS NO PROBLEM

A373 has been generally specified for welded construction of bridges and buildings. The chemical requirements at left indicate how closely A36 agrees with A373 in chemistry and, therefore, in weldability. Where weldability is required, the controlled chemistry will permit the use of A36.

INCREASE IN YIELD POINT SAVES WEIGHT

The substantial increase in yield point for A36 makes it a real bargain in strength-to-weight ratio at a very nominal cost. The weight saved by designing with A36 steel will result in even greater economy for steel construction.

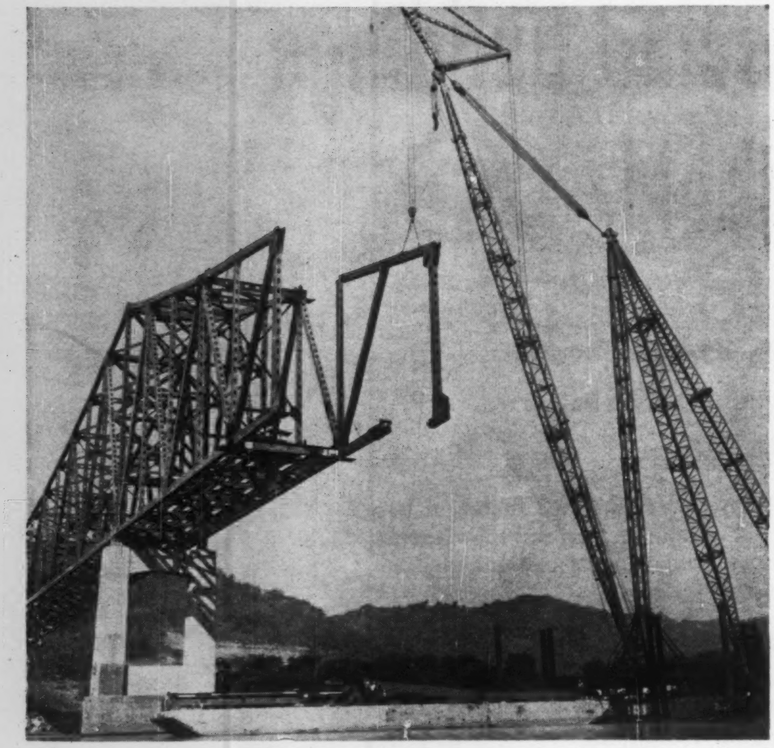
A36 IS AVAILABLE IN ALL SIZES AND SHAPES

A36 can be furnished from the same schedules and in all sizes and shapes in which A7 and A373 are rolled.

FOR MORE INFORMATION on new A36 steel, write for Folder 773, and Booklet 569. Or get in touch with the Bethlehem sales office nearest you.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.
Export Sales: Bethlehem Steel Export Corporation

Field and Office



Ohio River bridge takes shape as . . .

Big Derrick Places Trusses

A huge stiff-leg derrick with a 200-ft-high boom and a 50-ft jib handled truss erection on a recently completed Ohio River bridge.

Designed by John F. Beasley Construction Co., Chicago, specifically for bridge erection, the derrick has a 150-ton capacity. It was mounted on barges for this job, but can also be mounted on a set of motorized wheels that ride on tracks.

The derrick was moved across the water with a system of cables. Rapid positioning of the derrick is one of its main advantages; this was particularly important on this job, where there was heavy river traffic and the derrick was moved in and out of the channel daily.

Located at New Martinsville, West Virginia, the bridge connects Ohio with West Virginia and replaces a ferry. It is 2,100 ft long and consists of five girder spans (totaling 520 ft) and a through truss with two 430-ft anchor spans and a 715-ft center span. Height of the truss over the piers is 100 ft.

The truss spans were fabricated from 2,900 tons of carbon steel and 1,300 tons of low alloy steel. The anchor span roadway is regular concrete and the center span is lightweight concrete with an asphaltic wearing surface.

Heaviest lifts were the six falsework towers used under the anchor spans. They were 60 ft high and weighed 50 tons, including a movable hydraulic jack assembly. Assembled on shore and barged out into the river, the towers were hoisted into place by the derrick.

The derrick also placed preassembled sections including portals, top and bottom laterals and the floor system. The most intricate assembly was composed of three pin-connected truss members erected in one lift.

Another Beasley boom is being tried out on a Mississippi River bridge project near Helena, Ark. Claimed to be the world's largest, the boom is 250 ft long and has a 75-ft jib; its capacity is 125 tons. The boom was built for use on the $9 million Panama Canal bridge to start next year (ENR Mar. 10, p. 22).

The bridge is part of the Federal Aid Secondary System and is being built for the State Road Commission of West Virginia. It was designed by Praeger-Kavanagh, New York City, and fabricated by Mt. Vernon Bridge Co., Mt. Vernon, Ohio.

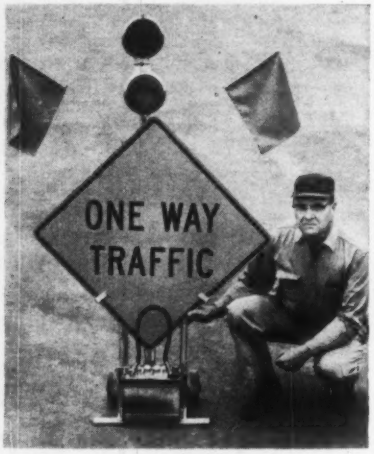
Emulsion-Straw Mix Controls Dust at Jet Base

The Corps of Engineers has applied a mixture of asphalt emulsion and straw to eliminate excess dust sucked into air intakes of jet engines from unseeded areas adjacent to runways at Wurtsmith Air Force Base, Oscoda, Mich. The dust problem had resulted in excessively high engine maintenance costs.

Constant use of runways and the heavy wind eddies developed during takeoffs ruled out use of a standard mulch as holding material during germination of soil cover.

The mixture had 100 gallons of Bitumuls Soil Cover per ton. A straw mulch machine designed by William Reinhold, landscape engineer, applied two tons of the mixture to each of 600 acres.

The cover was effective in holding soil in place until plants were firmly rooted for permanent protection.



"Flashing Flagman" Alerts Motorists to Repair Jobs

Portable light stands dubbed "flashing flagmen" are in use by Oregon Highway Department bridge and road crews to direct traffic while emergency repairs are being made, where crews are working at night or in locations of impaired visibility.

The signs have flashing red and amber lights mounted on telescoping standards over paired yellow flags and informative signs. The lights can be raised as high as 10 ft to clear obstructions such as parked cars or trucks. Twelve-volt batteries power the units and serve also to stabilize the stands against the wind.

The device was developed in the Salem maintenance division.

Some Ideas

K+E

for your file of practical information on graph papers

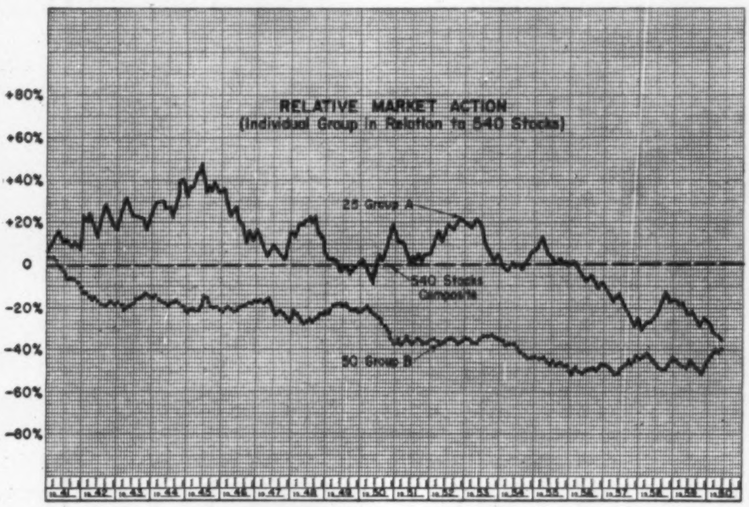
KEUFFEL & ESSER CO.

A graph can be defined as: "A picture of a collection of facts." Often, like that well known Chinese watercolor, a graph is worth a thousand words – or figures. There's no question that graphs speed up comprehension. In some cases, no other way exists to show the subtle interaction of statistics and data except by graph. It's no wonder that legions of engineers, architects, scientists and businessmen rely on graphs and charts to give them the complete information they need.

The big wonder is that more don't know and take full advantage of the fabulous variety of graph papers available from K&E. This is sort of a crusade with us – and has been ever since the turn of the century (a *billion plus* graph sheets ago).

Just The Right Sheet For You

The graph sheet shown below is just one of thousands of job-matched papers made by K&E. These are grids and patterns evolved to solve *specific* needs. The chances are roughly 1000 to 1 that we have exactly the paper you need to chart the statistics of your company or job.

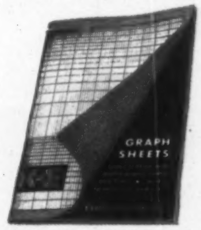


12,300 variables at a glance. Here's a typical stock market chart used to study relative market action. Center line is market behavior of 540 stocks over 20-year period. Two basic stock groups of 25 and 50 individual stocks, averaged, are plotted against market (figured at zero per cent). Resultant chart shows all-important slope of curve which – far more than gross increases – tells the story of the stocks' vitality. No list of statistics, no matter how exhaustive, could give the relative interactions shown here. This picture is possible only with a graph.

But if we don't have what you want – if we lose that 1000 to 1 bet – we'll gladly pay off by working with you to create exactly what you need. We've done this thousands of times for other customers. Just recently it was the U.S. Bureau of Standards. We worked with them to devise two new sheets for recording the complex heat reaction patterns of various insulating materials. These two sheets are already "standards" in the electrical industry.

Choosing That "Right Sheet"

What *is* the graph paper that will do the best job for you? (Actually, there may be more than one – dozens perhaps.) We could answer that here, but we've already done so in a brand new edition of our famed K&E Graph Sheet Catalog. Not only does this catalog guide you in the selection of the sheets you need, it shows you – often full size, in color – the patterns in question.



We've printed an ample supply of this new catalog, and are prepared to send you your copy *free*. Just return the coupon below.

What Makes Graph Papers Different?

There's a wide gulf of quality in graph papers – more than you'd dream possible. Only the finest sheets can really accomplish the complex, accurate work they're designed for. That's why we build-in three important features:

PRINT. Every K&E Graph Sheet ever made was printed from precision-engraved plates by the *letter-press* process. Offset printing, to our way of thinking, relies unduly upon the vigilance and skill of the printer. Variation from lot to lot is a distinct possibility. We have never taken that chance . . . and we're the *only* manufacturer of graph papers that hasn't.

PAPER. All K&E graph sheets – translucent or opaque – are printed on papers with at least 50% rag content – in some cases 100%. Every square foot of this stock is examined in our quality control labs *before* being sent to the printer. Top grade paper means that adjustment upward in accuracy and long life which is so important to so many people.

PACKAGE. Locating graph sheets can be a chore if they're packaged in old-fashioned boxes or envelopes where you can't see what's inside. Especially true if you use a big variety of sheets. Solution: the new *visual* package offered by K&E. The package has a "window" in front so you can see the sheet inside. In addition, there's a full description of the style, number of grids, line color, type of paper, etc. printed on three sides of the package. Designed to serve as a file folder, the package can be stored flat if desired.

K+E
Graph Sheets
358-2
100 SHEETS

We'd like you to see this new package, and a representative sampling of K&E graph sheets you can more than likely put to immediate use. This too is yours free just for returning the coupon below.

And for all the facts about graph papers, and any other of the 9,000 products made by K&E, see your nearby K&E dealer.

KEUFFEL & ESSER CO., Dept. ENR-12, Hoboken, N. J.

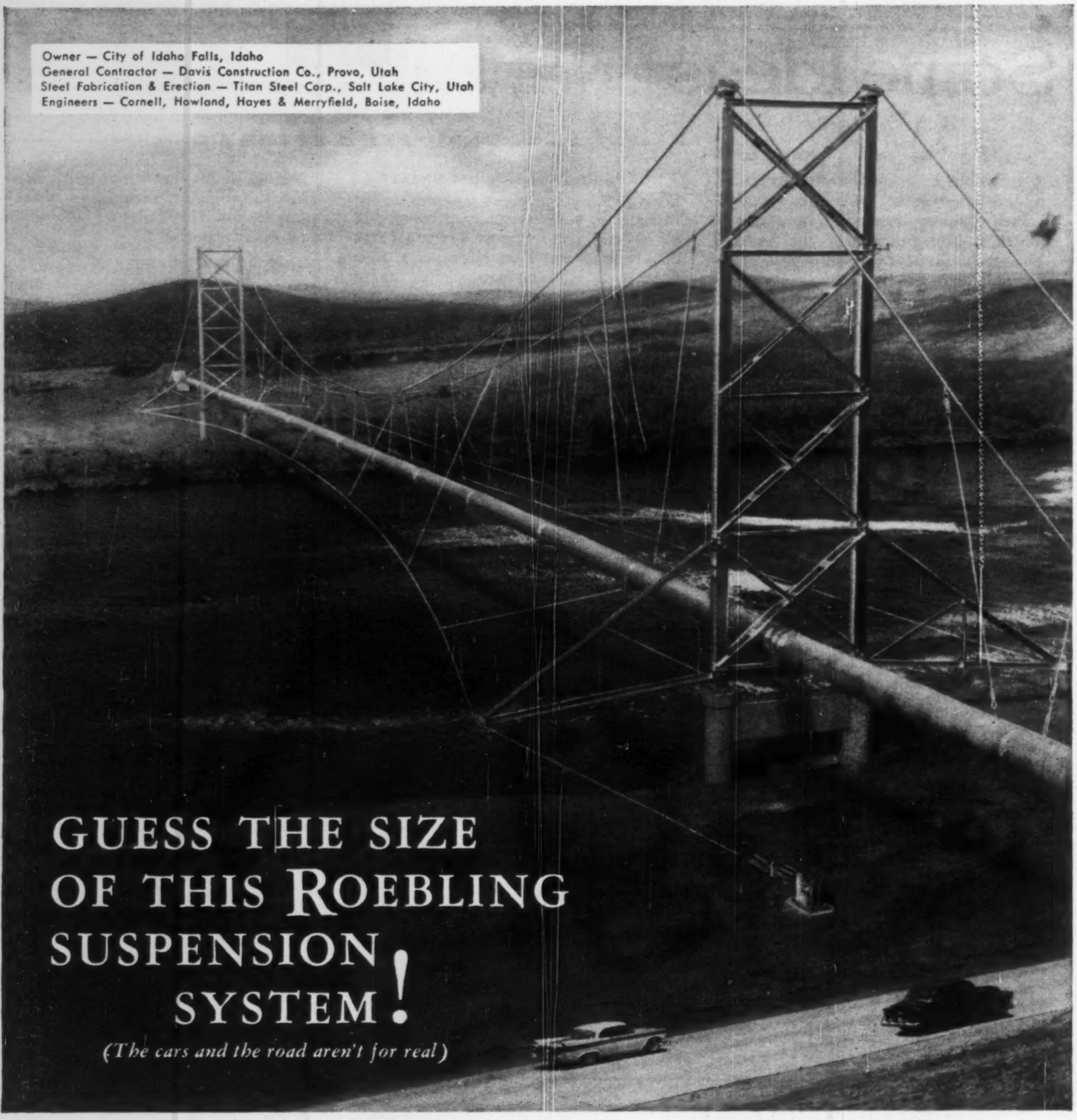
Please send me your new graph-sheet package with samples of K&E graph paper, and the latest K&E Graph Sheet Catalog & Selection Guide.

Name & Title: ____________________

Company: ____________________

Address: ____________________

2848


Owner — City of Idaho Falls, Idaho
General Contractor — Davis Construction Co., Provo, Utah
Steel Fabrication & Erection — Titan Steel Corp., Salt Lake City, Utah
Engineers — Cornell, Howland, Hayes & Merryfield, Boise, Idaho
GUESS THE SIZE OF THIS ROEBLING SUSPENSION SYSTEM!
(The cars and the road aren't for real)

It looks huge, doesn't it?

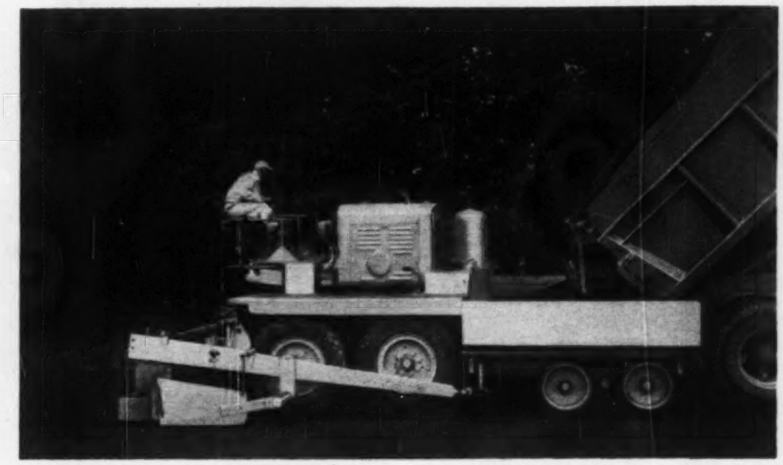
It isn't. It is an 18-inch gravity pipeline across Idaho's Snake River. Its overall length is 360 feet, 240 feet between towers.

We think this is proof that when it comes to suspension systems, size is no object. We are in a position to furnish specialized technical services, materials, and, when necessary, construction services, for any part of a suspension-system project, from conception to the last coat of paint. This includes bridges for pipelines, for conveyors, for pedestrians or for vehicles.

Don't think for a moment that your needs are too modest. We invite inquiries on suspension systems of any kind (18-inch pipelines or 18-lane vehicular bridges). Just ask Roebling's Bridge Division, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities
John A. Roebling's Sons Division, The Colorado Fuel and Iron Corporation



Finisher has rubber tires, hydraulic-powered wings.

Smith Enters Asphalt Field

The Mark IV rubber-tired asphalt finisher is the first in a line of bituminous finishers to be manufactured by T. L. Smith Co. With a capacity of over 400 tons per hr, it paves a strip from 6 to 13 ft wide at speeds up to 102 ft per min.

Weighing in at 10 tons, the machine is 19 ft long and—with the screed attached—is 8½ ft wide. The receiving hopper has 10-ton capacity. The finisher is powered by a Chrysler engine producing 88 hp at 2800 rpm.

Two rear drive wheels can be braked together or separately. Another set of rear wheels—that drive and steer—is linked with a dolly on the front of the machine that contains tandem solid oscillating wheels for tractive power. The finisher—hydraulically steered—can go around sharp turns or close to curbs without binding.

Two hydraulically-lifted side wings throw material into the center of the hopper where two conveyors are located. Each conveyor is operated separately and feeds only one side of the screed.

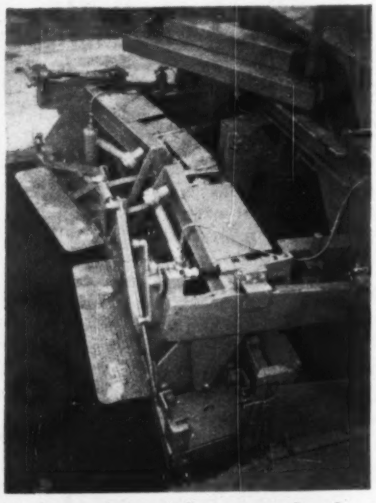
The finisher has 11 forward speeds for paving from 15 to 102 ft a min. It will go 4½ mi per hr in reverse and a highway speed of 10 mi per hr is possible. The drive wheels are equipped with rubber sand service tires.

A V-shaped screed with sides swept back 7½ deg feeds material toward outside edges of the mat. Mix flow from the hopper to the screed is controlled automatically by two levers which "float" on the stream of material. The levers signal the conveyor to start or stop the flow.

The heating system of the Mark IV will work on any kind of bottled gas, and it is designed to give an even distribution of heat across the full width of the screed plate, even when the plate is extended.

Dual controls at the ends of the screed arms make it possible to regulate the laydown thickness of the mat from ¼ in. to 6 in. A single control at the center of the screed regulates crown setting.

A hydraulic cylinder, controlled from the operator's position, swings the operator's platform from the extreme right to the extreme left, for unobstructed view of the screed and mat. T. L. Smith Co., 2835 N. 32nd St., Milwaukee, Wis.



V-shaped screed sweeps back.

(*New Products continued p. 60*)

POSEY WORKS FOR BETTER—
PIPE & SPECIALS

Large OD AWWA pipe for water and sewerage—can be coated, wrapped or lined. Special fittings designed and fabricated.

For FREE 16-page illustrated catalog of large O.D. pipe, write:

POSEY IRON WORKS INC.
Custom Fabrication For Over 50 Years

DIVISIONS:
• Iroquois Asphalt Plants • Mixers and Blenders
• Tunnel Forms • Industrial Heating • Foundry
• Large OD Steel pipe

561 S. PRINCE STREET LANCASTER, PA.

ARE YOU DRIVING TIME AWAY?

Time is indispensable . . . Don't waste it by DRIVING between widely dispersed, inaccessible construction sites.

GENERAL AMERICAN HELICOPTERS has the answer to this most pressing problem of missile base or large project construction . . . a complete air transportation package; flight equipment, experienced crews, all maintenance and hangar facilities. We supply only the finest, most modern equipment; including the new, supercharged Bell 47G-3. Our flight and ground personnel are the industry's most experienced and qualified.

GENERAL AMERICAN HELICOPTERS provides rapid ambulance service to remote job sites . . . moves emergency parts or personnel speedily and safely . . . allows supervisory and executive personnel to inspect entire project and return to headquarters within minutes instead of hours.

Don't drive time away on your next project. Inquire about this time and travel saver today!

GENERAL
AMERICAN HELICOPTERS
Lockheed Air Terminal, Burbank, California

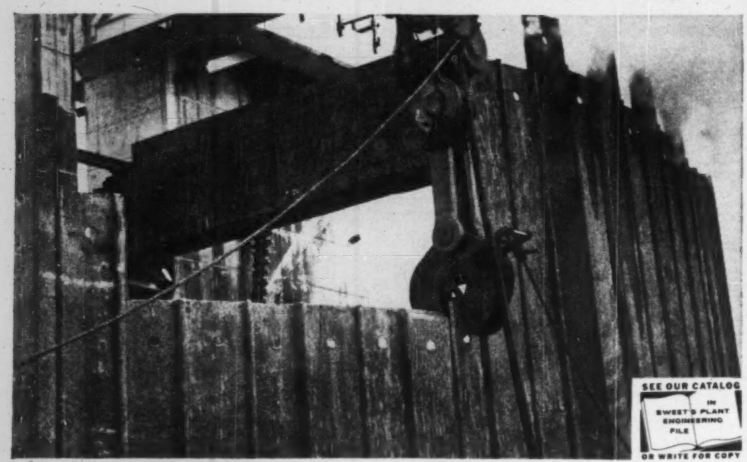
NAME ____
COMPANY ____
ADDRESS ____

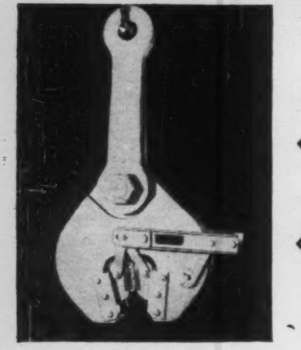
NEW HEPPENSTALL TONGS PULL PILING FASTER, SAFER

First used by Dravo Corporation in construction of the New Cumberland Dam at Stratton, Ohio, these new Heppenstall Tongs make the initial pull without manual attachment to the piling. Suspended from a piling extractor with jaws locked open, the Tongs are lowered over the piling. Slackening the control line disengages a retaining pin, which closes the Tongs. A wedge action causes the jaws to grip tighter as pull is increased. When the line is pulled, the jaws again latch open ready for the next piling.

Made in 30- and 50-ton capacities, the tongs have a ¼-inch minimum jaw opening, 1¼-inch maximum. Each jaw has a series of teeth to insure positive gripping. The 30-ton tongs weigh roughly 1,150 pounds, the 50-ton tongs about 1,650 pounds. Connecting brackets are furnished to fit the particular type of extractor being used.

For more information, and a quotation, contact your Heppenstall Company Representative or Materials Handling Division, 501 Sixteenth Street, New Brighton, Pa.





Designed by Heppenstall, these new Tongs pull sheet piling without need for clevis pins or other manual attachment.

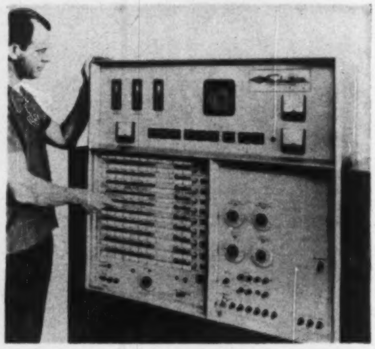
HEPPENSTALL COMPANY
Pittsburgh 1, Pennsylvania
PLANTS: Pittsburgh and New Brighton, Pa.
Bridgeport, Conn.

MIDVALE-HEPPENSTALL COMPANY
Nicetown, Philadelphia 40, Pa.

Die Blocks • Forgings • Back-Up Roll Sleeves • Rings
Industrial Knives • Materials Handling Equipment
Pressure Vessels • Hardened and Ground Steel Rolls
Vacuum and Consumable Electrode Melted Steels

DIG DRY

It's Faster and Cheaper
MORETRENCH WELLPOINT SYSTEM
Guarantees Results on Wet Jobs
Send for Catalog
MORETRENCH CORPORATION
World's Oldest, Largest and Most Experienced Predrainage Organization
Main Office & Plant: Rockaway, N. J.
Chicago, Ill., Tampa, Fla., Houston, Tex., Hackensack, N. J.



Remote Console Controls Concrete Batch Plant

An operator in a dispatcher's office can control a concrete batching plant from a new electric console known as Selectron.

The unit batches ten different preset formulas of seven different materials.

A dispatcher gives the console operator a batch ticket that contains formula, batch size and other specifications. The operator feeds this data into the console.

Tickets are stamped by the recording machine with the same number as the batch record, providing a permanent cross reference for future check or verification of the customer's order.

Removed from the batch deck, electrical parts are kept free of dust and dirt and maintenance is reduced.

Using this console, it is possible for one man to serve as dispatcher and operate the batching plant and aggregate system from one office. NOBLE CO., 1860 7TH ST, OAKLAND, CALIF.

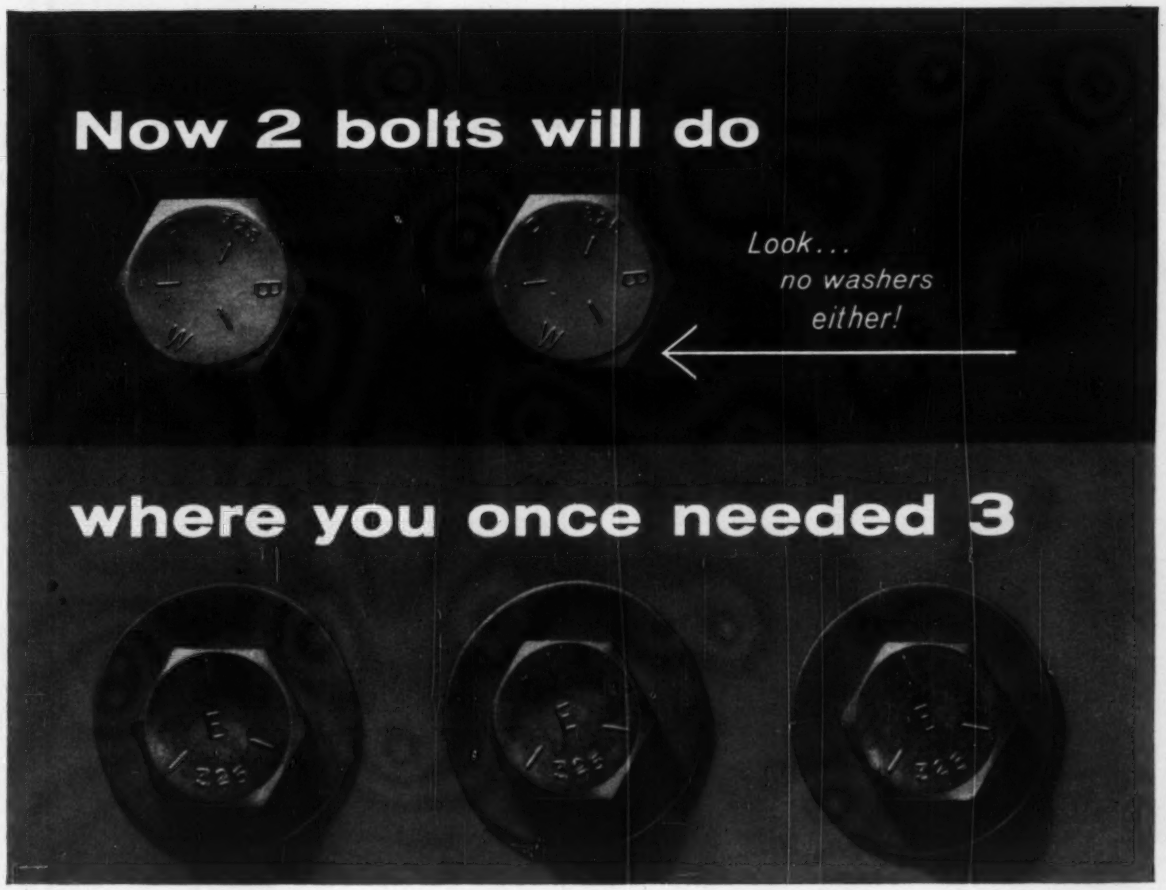
Two End Dump Models Added to Hauler Line

Models 42 and 60 are recent end dump additions to the Haulpak line of off-highway haulers.

The 60-ton-capacity truck weighs 33 tons and is powered by a 550-hp Cummins turbocharged diesel engine. An Allison Torqmatic transmission has six speeds forward. Top speed for the Model 60 is 47 mph.

The Model 42 is powered with a 430-hp Cummins diesel and the six-speed Allison transmission. It is capable of a top speed of 48 mph.

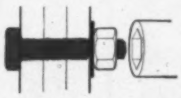
Conventional axles and springs are eliminated by the use of four pistons acting like giant shock absorbers. There are no tie rods or exposed steering linkage. The machines are equipped with power steering and power brakes. LETOURNEAU-WESTINGHOUSE CO., 2301 NE ADAMS ST., PEORIA, ILL.



...when you connect bearing joints with new design RB&W High Strength Bolts

Majority of structural steel joints are bearing-type joints. This is precisely the type that can now be connected *faster, at less cost,* and *with full design strength* by taking advantage of the new large head RB&W High Strength Bolts.

Their shorter thread length assures that the shear plane of the joint will not pass through a threaded section (see sketch). Full shear strength of the bolt is now realized. Two bolts can do the work of three regular bolts . . . or replace three rivets.



In addition, the new larger head enables bolt to be torqued up to full recommended tension without any crushing of the bearing surface. Use one washer only—under the bolt head or nut, whichever is rotated during the wrenching.

This exciting new fastening improvement has been thoroughly tested under the auspices of the Research Council on Riveted and Bolted Structural Joints and is now approved by both the Council and the AISC.

As a leader in pressing for this now recognized improvement, RB&W is producing a full range of bolt sizes, all conforming to ASTM A 325 specification, all with *certified* quality. Start immediately to profit from the engineering, shop fabrication and field erection advantages afforded by RB&W High Strength Bolts. Send for details.

RB&W
116th year

Plants at: Port Chester, N.Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. Additional sales offices at: Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. Sales agents at: Cleveland; Milwaukee; New Orleans; Denver; Fargo.

LARGEST INDEPENDENT PRODUCER OF HIGH STRENGTH BOLTS FOR CONSTRUCTION

Bridge widened quickly, inexpensively,

On North Avenue in the city of Brookfield, Wisconsin, a narrow bridge was hampering traffic in and out of the city. A new residential development was slated to be built nearby, which would mean still more traffic. The bridge had to be widened. It was done quickly and inexpensively, thanks to Corrugated Galvanized Steel Culverts.

Here's how they did it: two 15-foot lengths of 84-inch diameter beveled end Corrugated Steel Pipe were laid side by side on each side of the existing bridge. The round ends were mortared inside the bridge opening, the beveled ends facing out. Fill was loaded and graded to conform with the angle of the beveled end of the pipes. Gravel and crushed rock were placed, the roadway itself was then resurfaced and widened, and the job was complete. Pipe installation took less than a week, and now Brookfield's bridge is six feet wider.

According to information received from the City Engineer's Office, the installation of a Corrugated Galvanized Steel Culvert drastically cut both construction time and construction costs. Other methods would have required additional supporting members, which alone would have cost as much as the pipe. A corrugated culvert was the least expensive, and it was felt that it was as sound a construction method as could be used.

Quick, economical installation is just one advantage of Corrugated Galvanized Steel Drainage Structures. They cost less, are free from upkeep and repair, and they're built to **last.** For more information on Corrugated Galvanized Culverts, send for U. S. Steel's free booklet, "USS Culvert Sheets for Corrugated Metal Drainage Products."

Write today, to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS is a registered trademark

USS

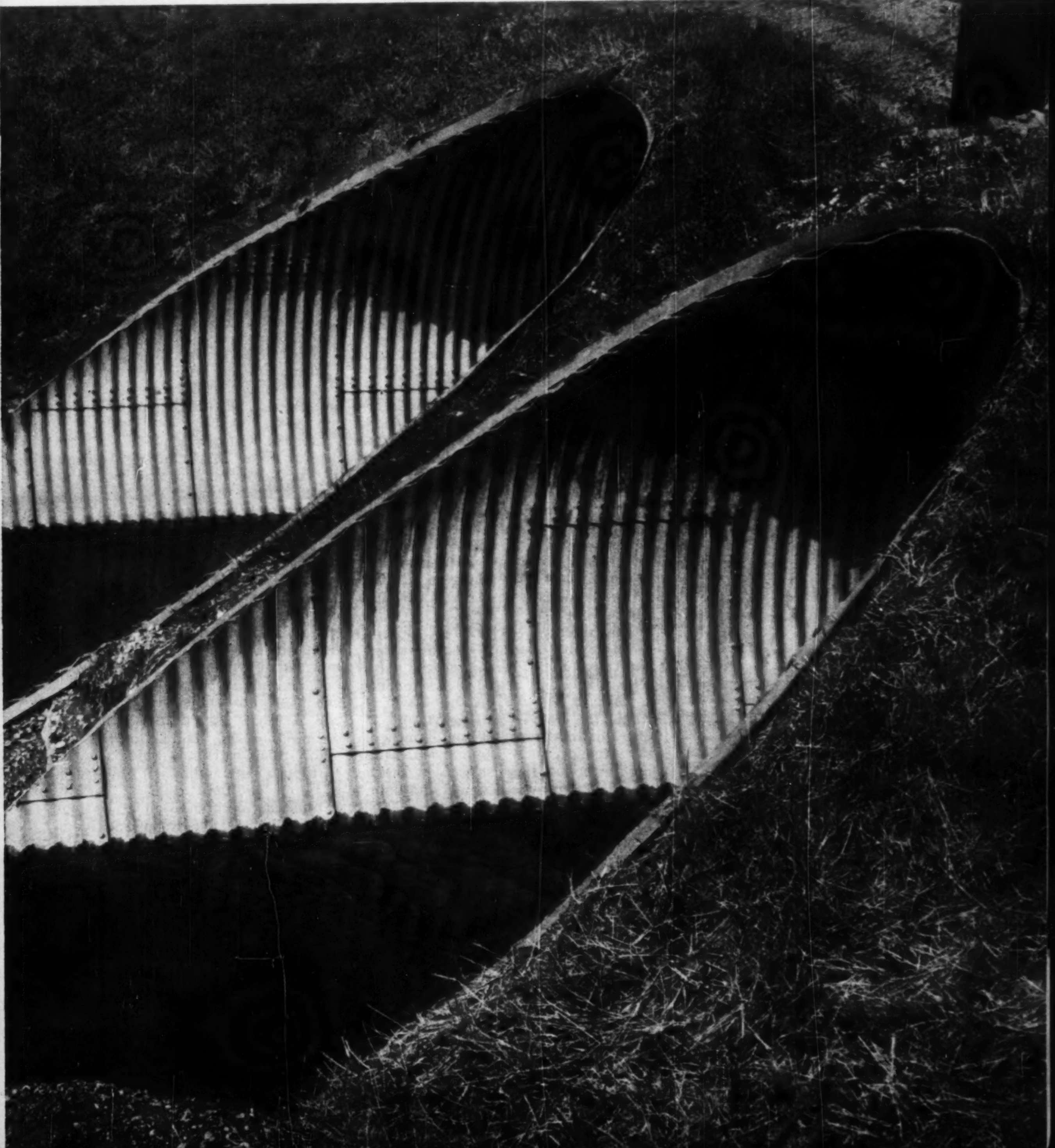
United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company
United States Steel

Watch United States Steel's special Christmas show, **The Coming of Christ,** in Color on NBC-TV, Wednesday, December 21, 8:30 P.M., E.S.T.

Galvanized Steel

This mark tells you a product is made of modern, dependable Steel.

with Corrugated Galvanized Steel Culverts



New book tells
Where . . .
How . . .
to place reinforcing bars

Written for bar setters and inspectors . . . as a manual for apprentice courses . . . and a reference for specification writers, architects, engineers, and detailers.

Contains complete specifications and instructions for placing reinforcing bars, welded wire fabric, and their supports.

Prepared under the direction of the C.R.S.I. Committee on Engineering Practice.

287 PAGES
HANDY POCKET SIZE
$3.00
No C.O.D. orders accepted. Refund if returned within 10 days.

Concrete Reinforcing Steel Institute
38 South Dearborn Street (Dept. L)
Chicago 3, Illinois

DUDGEON HYDRAULIC JACKS
SALES
RENTALS
•
CAPACITY TO 600 TONS

FOR:
PILE TESTING
•
UNDER-PINNING
•
BRIDGES
•
PIPE PUSHING
•
SOIL TESTING

Write to Dept. R

RICHARD DUDGEON INC.
789 BERGEN ST. • ST 9-4040 • BROOKLYN, N. Y.

SALES—RENTALS
ROOF, WALL SLABS
DECK, FLOOR,
MONOLITHIC
SEWERS—DRAINS

NEW! VOIDS IN CONCRETE with
ELGOOD INFLATABLE VOID FORMS

REUSABLE RUBBER VOID FORMS FOR SEWERS, SLABS, DRAINS & DUCTS. SUPERSEDES ALL VOID FORMING TECHNIQUES.

- ALL DIAMETERS ¾" TO 120"
- GUARANTEE MINIMUM OF 100 USES
  Field experience, 250-3000 uses
- STAFF AVAILABLE FOR SPECIALIZED PROBLEMS

ELGOOD CONCRETE FORMS CORP.
378 TEN EYCK ST., BROOKLYN, N.Y. HY 7-5445

Men and Jobs

Brig. Gen. Clarence Renshaw

Brig. Gen. James B. Lampert

High Corps Post Changes Hands

Brig. Gen. Clarence Renshaw retired last week as Director of Military Construction in the Office of the Chief of Engineers, after 31 years active service with the Corps. The vacated post will be filled in January by Brig. Gen. James B. Lampert, now in Vietnam as a deputy chief of the U. S. Military Assistance Advisory Group there.

General Renshaw, 53 years old, intends to continue an active career in construction, but he has no fixed plans for the next few months. He will maintain residence in Washington, D. C., at least until early spring while shaping future plans.

His successor, 46-year-old General Lampert has been a nuclear power expert for the Corps. For five years, 1952 to 1957, he held dual assignments as Special Assistant to the Chief of Engineers for Nuclear Power and as Chief of the Army Reactors Branch of the Atomic Energy Commission. During this period, the first package reactor at Fort Belvoir was designed and built.

A 1936 graduate from the U. S. Military Academy at West Point, General Lampert served in the Pacific Theater during World War II. As Engineer, XIV Army Corps, he participated in the invasion of Luzon, the capture of Manila and the occupation of Japan.

Later, General Lampert had served in 1946 as executive officer to Lt. Gen. Leslie R. Groves on the Manhattan Project, followed by two years as special assistant to Maj. Gen. K. D. Nichols, Chief of the Armed Forces Special Weapons Project.

Between these special assignments, General Lampert headed the Arkansas-White-Red Rivers Inter-Agency Office and served as District Engineer, Charleston S. C.

General Renshaw acquired advanced degrees from Massachusetts Institute of Technology and worked on Army projects from Panama to New York during the 12 years following his 1912 graduation from the Military Academy. In 1941 he was placed in charge of design and construction of the Pentagon, which he completed in 1942.

During the next two years, General Renshaw served as District Engineer at four locations, ending up at Manila, from which he was called back to organize and command Engineer troop battalions for European and Pacific theaters. In Philadelphia in 1944, General Renshaw was charged with the organization and training of the Engineer troop battalions which manned port repair ships and militarized dredges in Europe and the Pacific.

In 1946, back in Manila, he took command of 20,000 troops in a combined organization for construction and rehabilitation.

Back in the U. S., General Renshaw in 1951 organized and commanded the Northeast District of the Corps which built the arctic air base at Thule, Greenland. Following that task, he was District Engineer in Okinawa and Division Engineer of the North Atlantic Division for four years. He moved from that position to Director of Military Construction in May 1959.

H. Earl Fullilove

Biggest Employers' Group Names 1961 Chairman

The country's biggest Building Trades Employers' Association undergoes a change in its top command on January 1.

Peter W. Eller, chairman of the board of governers of the Building Trades Employers' Association in New York City, retires on that day and will be succeeded by the present vice chairman, H. Earl Fullilove.

Mr. Fullilove joined the BTEA early last year in the newly-created office of vice chairman of the board of governers. Before that he had been for 18 years with the George A. Fuller Co. of New York City, serving since 1950 as director of labor relations.

Mr. Eller, long known in the construction industry, started in 1912 in the construction department of Thompson Starrett Co., New York City. He moved through progressive stages to become president of Thompson Starrett in 1943. While still with them he was a member of the BTEA executive committee for 13 years; on the board of governers for 16 years; and president for four years.

He is also the only employer ever to hold the office of National Referee of the Building and Trades Department of the American Federation of Labor, having been elected to that post from 1941 to 1944.

In addition, Mr. Eller is a member of the Public Works Advisory Board of the State of New York and a member of the board of governers of the New York Building Congress.

A board chairman since 1949. Mr. Eller will continue as a consultant of the BTEA.

Calculate wherever you circulate with the NEW Jet-log® Jr. SLIDE RULE BY K&E

one-half actual size

Functional as it is, a 10-inch slide rule just wasn't meant for stuffing in the pocket of a business suit. Just as the 10-inch is best for desk-duty, the 5-inch JET-LOG Jr. is *ideal* for the man on the go. Has the same famed Decitrig Scale System as its "big brothers"; the DECITRIG® and JET-LOG Slide Rules. Made of durable IVORITE® with top grain leather case, clip, *and . . .*

UNCONDITIONAL LIFETIME GUARANTEE

Clips neatly onto your pocket. Look for this display carton. *(A wonderful gift item, too!)*

only $10.25

K+E KEUFFEL & ESSER CO.

New York • Hoboken, N. J. • Detroit • Chicago • Milwaukee • St. Louis • Dallas • Denver • San Francisco • Los Angeles • Seattle • Montreal

WATER MEASUREMENT

. . . accurate easy to read

PARSHALL MEASURING FLUME

For open channels in industrial plants, waterworks, irrigation systems and sewage disposal plants. Galvanized steel.

- Self-cleaning
- Easy to read
- Low head loss
- Throat widths: 3" to 10'

AUTOMATIC CONTROL GATES

Regulate flow and water levels regardless of water supply variation. Ends need for 24-hour supervision . . . prevents waste, flood damage and overflow. No floats, sheaves, motors or cables.

WELL CASING Scientifically designed for all soil conditions. Made of mild, stainless and alloy steels for long life and low initial cost. Five perforations and four field joints for fast assembly. Write for free literature.

TPO-1A

THOMPSON PIPE & STEEL COMPANY

3029 Larimer Street • TAbor 5-1241 • Denver 1, Colorado

FOUNDATIONS
UNDERPINNING
PILING

Spencer
White &
Prentis INC.

SHORING
COFFERDAMS
"COLCRETE" PROCESS

CATALOGUE
ON REQUEST

10 E. 40th ST., NEW YORK 16
DETROIT: 2033 PARK AVE.
CHICAGO: 221 NORTH LaSALLE ST.
WASHINGTON, D. C.: TOWER BLDG.

YOUR POSTMASTER SUGGESTS:

For Faster and More Efficient Postal Service—Learn the "A.B.C.'s" of Good Mailing Habits!

A—postal delivery zone number helps speed your mail!

B—certain to include your return address on all mail!

C—that the delivery address is correct and complete!

—and—

Mail Early in the Day—It's the Better Way!

Roads, water and sewer improvements for . . .

Colorado National Monument

Only two contractors entered the bidding for the Colorado National Monument improvement project to add roads, parking areas, and water and sewer systems to the park. Corn Construction Co., Grand Junction, Colo., was low at $98,980, 10% under W. B. Johnson Co., Inc. of Grand Junction, and 12% below the government engineers estimate.

Prevailing wage rates on this job, fringe benefits not included, are: carpenters, $3.10 per hr; piledriver operators, $3.25/hr; concrete finishers, $2.90; electricians, $3.60; and $2.22/hr for common labor.

The bidding included:

1C	Corn Construction Co., Grand Junction, Colo	$ 98,980
2	W. B. Johnson Co., Inc., Grand Junction, Colo	109,414
EE	Government Estimate	112,493

Schedule 1—Campground Roads, Saddlehorn

Bids: 7-27-60 Items	Unit	Quantity	Unit 1C	Prices 2
Clear & grub	acre	2.55	$900.00	$500.00
Loader operation, rent	hr	22	12.00	13.00
Truck, 5cy capacity, rent	hr	32	7.00	8.00
Tractor, cat D-7 or equal, with bulldozer & detach ripper tooth when req, rent	hr	22	16.00	15.00
Grader motor cat 12, rent	hr	60	13.00	13.50
Roller, pneumatic, rent	hr	40	11.00	11.50
Water, subgrade & base	gal	100	5.00	6.00
CMP, culvert 22"x13"	lf	50	7.50	8.00
18"x11"	lf	160	7.00	6.50
22"x13" flared end sec.	ea	2	50.00	40.00
18"x11"	ea	6	45.00	50.00
Base, mat crse 1½" for rdwy, f&p	t	1,815		
Asph, rapid cur, cut back gr RC-3, for seal coat	gal	3,540	0.30	0.32
Surf, bit plnt mix, f&p	t	420	12.00	13.50
Asph, med cur, cut back gr MG-1, for seal coat	gal	2,110	0.30	0.20
Chips, f&spread	t	110	8.00	7.00
Barrier, rock, 1½cy, field stone type rock, f&p	ea	.....	1.50	2.00

Schedule 2—Picnic Parking Area, Saddlehorn

Bids: 7-27-60 Items	Unit	Quantity	Unit 1C	Prices 2
Loader operation, rent	hr	10	$12.00	$13.00
Truck, 5cy capacity, rent	hr	15	7.00	8.00
Grader, motor cat 12 or equal oper & maint by contr, rent	hr	30	13.00	13.50
Roller, pneumatic, rent	hr	20	11.00	11.50
Water, for subg & base	Mgal	100	5.00	6.00
Aggregate, base crse, 1½"	t	955	3.00	3.75
Asph, med cur, cut back gr MC-1, for prime coat	gal	1,600	0.30	0.20
Surf, bit plnt mix, f&p	t	557	12.00	13.50
Conc, curb & gutter	lf	830	3.50	3.60
Walk, bit	sy	225	2.50	2.00
Header, sidewalk, 2"x6"	lf	125	1.00	0.50
Parking space, stripe	lf	2,065	0.30	0.20

Schedule 3—Water and Sewer Systems, Saddlehorn

Water System—Saddlehorn

Bids: 7-27-60 Items	Unit	Quantity	Unit 1C	Prices 2
Pipe, cmt lined, CIMJ, f&i cl 150 8"	lf	840	6.50	7.15
6"	lf	650	5.25	6.05
4"	lf	1,240	4.25	4.88
CI tee 8"x8"x6"	ea	2	100.00	75.00
6"x6"x6"	ea	2	75.00	73.00
6"x6"x4"	ea	1	70.00	65.00
4"x4"x4"	ea	2	50.00	50.00
Pipe, steel galv stnd & fittings 2"	lf	940	2.75	2.75
¾"	lf	360	2.50	2.25
CI reducer 8"x4"	ea	1	50.00	54.00
6"-4"	ea	2	40.00	38.00
CI bend 8",11¼-45 deg	ea	1	75.00	69.00
6", 11¼, 22½, 45 deg	ea	2	50.00	45.00
90 deg	ea	2	50.00	45.00
4", 11¼ to 45 deg	ea	3	40.00	35.00
Flange, reducer 4"-2"	ea	1	75.00	70.00
CI vlve box & gate vlv 6"	ea	2	150.00	160.00
4"	ea	2	115.00	120.00
2"	ea	3	90.00	70.00
Vlv, air release & corr met vlv box	ea	1	200.00	220.00
Hyd, fire 6" with operating wrench, gate vlv & box, i	ea	3	500.00	480.00
Fountain, drink, & water ser, CI grate & conc base	ea	4	500.00	475.00
Meter, water similar & equal to Hersey mod HD 2"	ea	1	350.00	390.00
Vlv, stop & CI vlv box ¾"	ea	4	40.00	35.00
Conc, vlv box with gate vlvs, plus CI tees, reducers, MH frame & cover, compl at reservoir	ls	job	2,500	3,780

Sewer System—Saddlehorn

Bids: 7-27-60 Items	Unit	Quantity	Unit 1C	Prices 2
Sew, VC, SS 6"	lf	910	$4.75	$5.25
CIP, soil 6"	lf	20	5.00	4.75
Conc, MH & cover	ea	8	300.00	400.00
septic tank. 5,000 gal capacity	ls	job	4,475	4,260
Sew disposal, sub-surf sand filter plnt, plus VCP 4", grvl, sand crse, embank earth, covers earth, fence chain link, gate, MH & cleanout	ls	job	11,500	13,000

Schedule 4—Water & Sewer Systems, Grand Junction Entrance

Water System

Bids: 7-27-60 Items	Unit	Quantity	Unit 1C	Prices 2
Pipe, galv steel stnd 1½"	lf	460	2.15	2.80
¾"	lf	20	1.05	1.90
CI vlv box, & curb stop 1½"	ea	2	75.00	65.00
& gate vlb 1½" near stn culv.	ea	1	57.00	60.00
Fountain, drink water ser, conc base, CI grate	ea	2	500.00	475.00

Sewer System

CIP, sew, Xtr heavy 6"	lf	90	2.95	3.00
Pipe, clay sew SS 6"	lf	20	2.20	3.00
MH, conc or brick	ea	2	250.00	350.00
Septic tank, 3,000 gal capacity	ls	job	1,822	2,320
Field, disposal	ls	job	1,298	1,980

Schedule 5—Picnic Shelter Road and Parking Area and Driveways for Residences of Grand Junction Entrance

Bids: 7-27-60 Items	Unit	Quantity	Unit 1C	Prices 2
Loader, operation, rent	hr	16	$12.00	$13.00
Truck, 5cy capacity, rent	hr	32	7.00	8.00
Tractor, cat D-7 or equal, with bulldozer & detach ripper tooth when req, rent	hr	16	16.00	15.00
Roller, pneumatic, rent	hr	8	11.00	11.50
Compressor, air port, & tools 50C.F.M. min capacity	hr	8	8.00	8.50
Grader, motor cat-12 or equal, rent	hr	8	13.00	13.50

Bids: 7-27-60 Items	Unit	Quantity	Unit 1C	Prices 2
Water, for rdwy constr	Mgal	50	$5.00	$6.00
Base, crse 1½", for rdwy	t	570	2.00	2.50
Asph, med cur cut back, MC-1 for prime coat	gal	980	0.30	0.20
Surf, bit plnt mix, f&p	t	340	10.00	12.00
Curb stone, f&t	lf	260	3.50	3.80

Labor and Materials Prices

Monthly Market Quotations by ENR Field Reporters

HOURLY WAGE RATES—Base rate + fringe benefits

	Common Labor Building	Common Labor Heavy Const	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Electrical Workers	Steamfitters	Truck drivers 1½ T	Truck drivers under 4 cy	Truck drivers over 4 cy
Atlanta	$2.00	$2.00	$4.00	$3.35	$3.60+7½¢	$3.675	$3.50+3¢	$4.00+5¢	$3.85+22½¢	$2.10	$2.20	$2.45
Baltimore	2.27+7½¢	2.27+7½¢	4.10+20¢	3.60+7½¢	4.00+178¢	3.35/4.05+10¢A	3.85+13¢	3.85+7½¢	3.84+175	2.20+15¢	2.20+15¢	2.20+15¢
Birmingham	1.95	2.05	4.05	3.23	3.65+10¢	3.30	3.37	3.65	3.70+12¢	2.00	2.20	2.45
Boston	2.75+10¢	2.65+10¢	4.05+30¢	3.65+10¢	4.14+20¢	4.05+20¢	3.80+45¢	4.10+25¢	3.95+27¢	2.70+23¢	2.70+23¢	2.70+23¢
Chicago	3.02½+7½¢	3.02½+7½¢	4.225+10¢	3.91+20¢	4.35+16¢	3.90+5¢	4.00+27¢	4.30	4.10+25¢	2.58+175¢	....	....
Cincinnati	2.90	2.80	4.025+12¢	3.90	3.95+10¢	3.575/3.80A	3.875+.01	4.09+.511	4.10+9½¢	2.65+62½¢	2.70+6¼¢	2.75+6¼¢
Cleveland	3.37	3.285	4.085+10¢	4.11	4.01+10¢	4.11	4.11	4.17	3.91+20¢	2.92+15¢	2.92+15¢	2.92+15¢
Dallas	1.85	1:85	4.10	3.45	3.55+7½¢	3.60	3.875+10¢	3.625+7½¢	3.70+8½¢	1.80/2.625	1.80/2.625	1.80/2.625
Denver	2.32	2.32	4.00	3.60	3.71+10¢	3.25	3.80+12¢	4.05+47¢	3.95+10¢	2.40/2.60	2.75	2.90
Detroit	2.90+34¢	2.90+34¢	3.98+33¢	3.63+46¢	4.00+27½¢	3.63+39½¢	3.75+38¢	4.00+52	3.90+49¢	3.03+175¢	3.03+175¢	3.03+175¢
Kansas City	2.58	2.63	4.075	3.625	3.775	3.57	3.875	3.90+427¢	3.80+9½¢	2.555	2.555	2.63
Los Angeles	3.08+10¢	3.08+10¢	4.20+25¢	3.825+20¢	4.27½+25½¢	3.81+20¢	4.25+42½¢	4.65+46	4.33+64¢	3.365+10¢	3.365+10¢	3.555+10¢
Minneapolis	2.85	2.85	3.875+15	3.50+15¢	3.62+15¢	3.60+33¢	3.60+33¢	3,70+44¢	3.62+37¢	2.85	2.85	3.00
New Orleans	1.92½	1.95	3.72½+7½¢	3.30	3.60+10¢	3.425+7½¢	3.34+5¢	3.90+7½¢	3.80+7½¢	3.425+7½¢	3.375+7½¢	3.375+7½¢
New York	3.45+28¢	3.45+28¢	4.80+60¢	4.55+36¢	4.60+65¢	4.80+38¢	4.70+67¢	4.15+1.25	4.65+61¢	2.35+26½¢	3.40+28½¢	3.40+28½¢
Philadelphia	2.55+10¢	2.60+15¢	4.25+17¢	3.885+15¢	4.45+23¢	3.935/4.215+10¢A	4.15+20¢	4.37½+16¢	4.20+31½¢	2.45+15	2.45+15½¢	2.45+15
Pittsburgh	2.725+20¢	2.55+20¢	4.45+20¢	3.975+20¢	4.30+20¢	3.73+20¢	4.225+20¢	4.60+34½¢	4.15+20¢	2.59+20¢	2.635+20¢	2.735+20¢
St. Louis	2.925+10¢	2.925+10¢	4.05+32½¢	3.875+10¢	3.875+10¢	4.00	4.00+07½¢	4.11+50¢	4.27½+25½¢	2.93+15¢	3.13+15¢	3.23+15¢
San Francisco	3.045+10¢	3.045+10¢	4.40+42½¢	3.725+36¢	4.275+25¢	3.80+35¢	3.79+63¢	4.22+29¢	4.36+72¢	3.19+11¢	3.27+11¢	3.08+11¢
Seattle	3.00+10¢	3.00 +10¢	4.15+30¢	3.38+20¢	3.76+10¢	3.84+20¢	3.72+30¢	3.95+27¢	3.89+28¢	3.40+20¢	3.40+20¢	3.60+20¢
Montreal	1.75+4¢	1.75+4¢	2.55+6¢	2.35+5¢	2.55+6¢	2.35+5¢	2.65+6¢	2.45+5¢	2.62+6¢s	1.75+4¢	1.75+4¢	1.75+4¢
Toronto	2.00+8¢	2.00+8¢	320+13¢	2.95+12¢	3.05+12¢	3.20+13¢	3.20+21¢	3.52+14¢	3.47+13¢	2.05+15¢	2.05+15¢	2.05+15¢

	Tractor Operators -Incl. bulldozers- 34-49 hp	Tractor Operators -Incl. bulldozers- 70-100 hp	Tractor Operators -Incl. bulldozers- 100 & over	Tractor scraper 15-16 cy	Power cranes & shovels ½ cy	Power cranes & shovels ¾ cy	Motor grader oper	Air comp oper	Air tool oper
Atlanta	$3.15	$3.15	$3.15	$3.15	$3.675	$3.675	$3.15	$2.825	$2 22
Baltimore	3.65+10¢	3.65+10¢	3.65+10¢	3.65+10¢	4.05+10¢	4.05+10¢	3.85+10¢	3.25+10¢	2.325+7½¢
Birmingham	3.30	3.30	3.30	3.30	3.30	3.30	3.30	2.89	2.15
Boston	3.52½+20¢	3.52½+20¢	3.52½+20¢	3.52½+20¢	3.90+20¢	3.90+20¢	3.52½+20¢	3.45+20¢	2.80+10¢
Chicago	3.65+5¢	3.80+5¢	3.70+5¢	3.70+5¢	4.25+5¢	4.25+5¢	3.70+5¢	3.55+5¢	3.85+5¢
Cincinnati	3.575+10¢	3.575+10¢	3.575+10¢	3.575+10¢	3.575+10¢	3.80+10¢	3.80+10¢	3.80+10¢	3.80+10¢
Cleveland	3.86	3.86	3.86	3.86	4.11	4.11	3.86	3.735	3.735
Dallas	1.80/2.625	1.80/2.625	1.80/2.625	1.80/2.625	3.325	3.325	1.80/2.625	2.00	2.00
Denver	2.50	3.10	3.10	3.10	3.25	3.25	3.10	3.10	2.60
Detroit	3.63+39½¢	3.63+39½¢	3.63+39½¢	3.63+39½¢	3.63+39½¢	3.63+39½¢	3.63+39½¢	3.63+395¢	3.03+34¢
Kansas City	2.875	3.325	3.325	3.325	3.57	3.57	3.325	3.325	2.675
Los Angeles	4.11+20¢	4.11+20¢	4.11+20¢	4.21+20¢	4.21+20¢	4.21+20¢	4.21+20¢	3.33+20¢	3.29+10¢
Minneapolis	3.23	3.45	....	3.45	3.67	3.93+10¢	3.23	3.12	3.00
New Orleans	3.42½+7½¢	3.42½+7½¢	3.42½+7½¢	3.42½+7½¢	3.42½+7½¢	3.42½+7½¢	3.42½+7½¢	2.72+7½¢	2.02½
New York	4.175+33¢	4.175+33¢	4.175+33¢	4.30+34¢	5.05+40¢	5.05+40¢	4.30+34¢	4.30+34¢	3.90+.195¢
Philadelphia	3.63+10	3.775+10	3.775+10	3.90+10	4.345+10	4.345+10	3.765+10	3.51+10	2.40/2.50+10¢
Pittsburgh	3.72+20¢	3.72+20¢	3.72+20¢	3.72+20¢	3.92+20¢	3.92+20¢	3.92+20¢	3.43+20¢	2.60+20¢
St. Louis	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.45	3.45
San Francisco	4.01+35¢	4.01+35¢	4.01+35¢	4.14+35¢	4.31+35¢	4.31+35¢	4.21+35¢	3.48+35¢	3.475+10¢
Seattle	3.81+20¢	3.81+20¢	3.81+20¢	3.81+20¢	4.18+20¢	4.18+20¢	3.90+20¢	3.54+20¢	3.20+10¢
Montreal	1.95+4¢	2.18+5¢	2.18+5¢	2.18+5¢	2.45+5¢	2.45+5¢	2.18+5¢	2.05+5¢	2.05+5¢
Toronto	2.45+10¢	2.55+10¢	2.55+10¢	2.50+10¢	3.05+12¢	3.20+12¢	2.85+11¢	2.55+10¢	2.55+10¢

ENR Skilled Labor Average (Bricklayers, Carpenters, Iron Workers): $4.095, ENR Common Labor Average $2.747

Description of fringe benefits last appeared Sept. 22 1960. •A 1-2 drum.

BUILDING BOARD & LATH AND INSULATION—DELIVERED TRUCKLOAD LOTS

	GYPSUM PLASTER BOARD tapered edge per Msq ft ½"	GYPSUM PLASTER BOARD tapered edge per Msq ft ⅝"	GYPSUM BOARD LATH plain or per f per Msq ft ⅜" x 16" x 48"	GYPSUM SHEATHING tongue & groove per Msq ft ½" x 2' x 8'	FIBER BOARD SHEATHING asph impreg & coat per Msq ft ½" sq ed	FIBER BOARD SHEATHING asph impreg & coat per Msq ft 25/32" T&G	FIBER BOARD INSULATION sq edge, paint per Msq ft ½"	MINERAL WOOL INSULATION loose, per 40-lb bag a	MINERAL WOOL INSULATION 3" batts per M sf	GLASS FIBER INSULATION loose, per 40-lb bag a	GLASS FIBER INSULATION 3" batts per M sf	ALUMINUM FOIL 60# Kraft 1 side foil per roll of 250 s. f.	ALUMINUM FOIL Expansible Blanket 2 layers foil per Msq ft
Atlanta	$65.00F	$55.00F	$42.50F	$68.00F	$72.00F	$127.00F	$75.00F	1.59z	$70.00F	$2.00	$80.00F	$4.77qi	
Baltimore	54.00	47.50	35.75	55.70	65.00	108.50	69.00	1.40F	67.50F	1.60F	47.00F	4.00F	$33.50F
Birmingham	68.90H	57.00H	47.77H	75.00H	67.50H	140.50H	83.50H	1.40	70.00	2.00	65.00	3.77gG	......
Boston	60.00mH	50.00mH	35.00mH	55.00mH	65.00H	120.00H	79 00hnH	1.40bH	75.00H	......	75.00H	5.30xHS	53.50qH
Chicago	67.00	54.00	45.00	62.00	87.00	123.00	87.00	1.85	80.00	......	63/65 l	5.25j	. . .
Cincinnati	52.50wH	42.85wH	33.05wH	51.16wH	77.00wH	125.00wH	72.50wH	1.45wH	60.00wH	1.45wH	60.00wH	2.85jwJ	50.00wJ
Cleveland	62.00CF	56.50CF	41.50CF	65.00CF	80.00CF	129.00CF	80.00CF	1.35	75/80H	......	67.00	14.00ioJ	55.00J
Dallas	56.25	46.85	42.50	56.25	68.75	118.00	68.75	2.00	70.00	1.75	70.67	5.00gAG	45.00
Denver	62.50H	51.50H	43.00H	67.00H	62.50H	103.50H	77.00	1.55b	65.00ub	2.00b	65.00a	5.25	48.65
Detroit	66.00K	56.00K	42.45K	66.00K	48.50DK	85.65DK	62.50DK	1.30b	52.00	1.85b	80.00	......	. . .
Kansas City	72.00H	62.00H	45.00H	.....	75.00H	122.00H	80.00H	1.40H	75.00H	1.80H	75.00H	3.60d	60.00
Los Angeles Q	66.00F	60.50F	0.33xF	64.50F	75.00F	125.00F	80.00F	76.00BeF	83.00F	1.35s	64.00	4.65g	7.90V
Minneapolis P	75.00F	65.00F	0.41xL	75.00F	95.00F	130.00F	78.00F	2.25yF	80.00F	2.10F	80.00F	4.25F	......
Montreal	58.00M	49.30M	37/41.50M	53.00M	64.75M	......	58.50M	1.50M	66.00M	1.50M	66.00M	9.00qM	56.00M
New Orleans	57.00H	52.00H	45.00H	60.00H	67.00H	140.00H	80.00H	3.00L	70.00*	......	......	......	62.50U
New York	65.00H	55.00H	42.50H	60.00H	78.00	124.00	78.00	1.55b	68.50k	......	......	4.38iH	40.00cH
Philadelphia H	53.00	45.00	36.50	52.50	65.00	115.00	65.00	1.20	50.00	1.40	50.00	2.95	83.50
Pittsburgh	74.00K	65.00K	40.00K	63.00K	60.00K	100.00K	60.00K	1.25sK	55.00K	1.25sK	55.00K	4.25iqK	38.50K
St. Louis	55-65.00HO	50-55.00HO	40.00HO	65.00HO	70.00HO	115/120HO	75/80.00HO	125/135	65-75HO	2.00PHO	74.00HO	4.39iqHO	......
San Francisco	60.00F	49.00F	0.36xF	61.00F	70.00F	111.00F	69.00F	1.75F	66.50F	1.75F	66.50F	5.10	60.00F
Seattle	68.00K	58.50K	51.50K	65.50K	65.00K	125.00K	71.00K	1.15tK	58.00K	1.90*pK	51.00*lKh	4.25K	46.50EK
Toronto	58.00	50.00	46.50L	67.50	79.00T	......	88.00T	1.85	60.50	......	60.50	15.00e	46.00

•* F.o.b. warehouse. •a Semi thick. •b 30# bag. •c 3 layers of foil: $54.50. •d 40# kraft paper, 5 Msf, 100/500 rolls. •e 20# sq ft bag, 4" thick. •f Full trailer loads. •g 80# kraft paper backing 400 rolls or over. •h LCL. •i 40#. •j 80#. •k 2-in. •l 2". •m 8 to 10 ton quantities. •n Distributor's siding. •o Per Msf roll. •p 32# bag. •q 500 sf. •s 35# bag. •t 26# bag •u Flame proof $75. •v 5000 sf quantity. •w F.o.b. city. •x Sq. yd. •y 30# bag. •z Spun rock wool. •A 650 sf. •B ton. •C F.o.b. plant, freight allowed. •D CL. •E 10 Msf. •F less 2% disc, 10th. •G ½ of 1%, 10 days. •H 2% disc, 10 days. •J 1% disc, 10 days. •K less 2% for cash. •L 5% disc, 10th mo. •M fed. tax incl. •N 1% disc, 10 days. •O add 2% sales ax. •P 50 lb. bags, •Q add 4% sales tax. •R revised. •S 45 lb. •T less 2%, 30 days. •U lots of 2806 sq. ft. •V 250 sf roll.

MEXICO CITY WAGES & PRICES

WAGES, av per week, 8 hr day (pesos)a		Nov. '60
Common labor,	building (peons)	101.50
	heavy const (peons)	136.50
Skilled labor,	carpenters 1 cl	210.00
	bricklayers 1 cl	245.00
	struct. ironworkers	315.00

•a 6 days work-extra day's pay

MATERIALS PRICES, F.o.b. City (pesos)	Nov. '60
Struct. steel shapes, fob Monterey	
I-beams, 3 x 3 x 4" ... per metric ton	1940.00
Reinf. steel, corrugated rods, per ton	
⅜"-½" x 11 meters consolidada	1900.00
¾"-1" x 11 meters	1800.00
Gravel, truckload, per cu meter	
Blue gravel	30.00
Cement, std. port. (Tolteca) ... per metric ton	260.00
Lumber, 2" x 4" 1st class pine 20 ft. ... per M sq. ft.	3000.00
2" x 4" 2nd class pine ... per M sq. ft.	2500.00

Materials Prices Monthly Market Quotations by ENR Field Reporters

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F. O. B. CITY

	PORTLAND CEMENT* Per bbl. C/L lots cash, dis. not deducted			SAND AND GRAVEL Per ton, carload lots			CRUSHED STONE Per ton, carload lots		CRUSHED SLAG Per ton, carload lots, f.o.b. plant		CONCRETE BLOCK 8x8x16-in.• truckload del.• per block		CONCRETE Ready Mixed 1:2:4 del. per cy 50 cy & over
	Paper	Bulk	Mortar	Gravel, 1½ in.	Gravel, ¾ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	Sand grav.	Lt. wgt. agg.	
Atlanta	$4.38a‡	$3.88a‡	$3.68a‡	$3.10s‡	$3.10s‡	$1.85‡s	$2.18s	$2.33s	$1.65r	$1.75r	$0.175o	$0.21o	$13.75g
Baltimore	4.44a	3.93a	3.57a	2.80‡a	2.80‡a	2.25‡a	2.85‡a	2.90‡a	2.05‡a	2.00‡a	.18a	.18a	13.50ou
Birmingham	4.43c	3.50cf	...	2.53ns	2.53ns	2.13ns	2.75s	2.75s	1.65d	1.75d	.19	.19	14.25q
Boston	5.83ip	4.52ap	4.90imp	3.00qsz	3.00qsz	3.00qsz	1.75qsz	1.85qsz	....	....	.23o	.275ao	15.00q
Chicago	4.52ag	4.02ag	4.15g	3.78‡e	3.78‡be	4.13‡be	3.95‡be	3.95‡be	2.25‡e	2.25‡e	.26‡e	.26‡be	14.50et
Cincinnati	4.84c	4.34c	4.31c	2.29‡cu	2.34‡cu	2.44‡cu	2.55‡cu	2.74‡cu	1.80u	1.80u	.19o	.25ao	15.00qr
Cleveland	4.77/.84‡	....	4.19‡ae	....	2.25ae	1.75ae	2.70fy	2.70fy	2.20‡f	2.20‡f	....	.23f	17.25u
Dallas	3.90a	3.46a	3.78a	2.65‡a	2.75‡a	1.90‡	2.47	2.67	....	....	....	.285	10.10z
Denver	4.89a	4.39a	4.89	1.95‡	2.15‡	1.42‡b	....	3.00‡z	....	.	.25	.27ao	11.90
Detroit	4.50a	3.91agq	4.08Ra	2.50cc	2.50cc	2.16cc	2.80ddbm	2.80ddbm	3.15ddaa	3.50ddaqaa	24u	.27‡au	15.50eaa
Kansas City	4.52a	3.92a	4.30a	....	....	1.85‡a	2.00‡a	2.00‡a	....	....	22a	.26c	14.50
Los Angeles#‡	5.12ch	4.68ch	5.60c	2.56‡at	2.76‡at	2.41‡at	2.41‡at	2.46‡at	....	....	225f	.385	12.46hlz
Minneapolis	4.68a	4.17a	4.26a	2.70‡ae	2.70‡ae	1.60‡ae	4.00‡ae	4.00‡ae	....	....	20q	....	14.55f
Montreal	3.36‡de†	3.11‡de†	3.72‡de†	1.90‡a†	2.15‡a†	2.40‡a	1.90‡†	2.15‡†	2.00†	2.00†	20†	.28t†	10.80ek†
New Orleans	4.17b	3.65b	3.97b	2.61b	2.61b	2.16b	....	....	1.65d	1.75d	.25r	.25	14.00o
New York	4.71a	4.20a	3.77a		3.20bk	2.30bkw	2.85blbb	2.85blbb	....	....	.265nwe	.32bwo	17.60ay
Philadelphia	4.51‡ae	4.01‡ae	3.63‡e	1.95‡a	1.95‡a	1.55‡a	2.00‡a	2.30‡a	2.25‡a	2.25‡a	....	.20w	13.90z
Pittsburgh	5.65bjk	4.62bj	5.00bjl	2.68‡aqr	2.68‡aqr	3.08‡aqr	2.00‡aqr	2.00‡aqr	2.10w	2.10w	.22rz	.22rz	16.15o
St. Louis##	4.54a	4.04a	4.24a	3.40‡as	3.80‡as	2.40/3.40‡as	1.75js	1.75js	....	....	.26‡	.32‡co	13.65/14.10q
San Francisco	4.34c	3.79c	4.78c	2.02	2.02	2.12	2.17	2.17	....	....	.24	.28cl	13.00cw
Seattle	4.47‡a	3.75ag	4.65a	4.25‡bm	4.25‡bm	4.25‡bm	4.50‡bm	4.50‡bm	....	....	.288s	.384cs	14.70j
Toronto	4.40ui	3.84t	4.40ui	2.40	2.40	2.05	2.40	2.40	2.40	2.40	.26	.30ci	13.75q

‡ Delivered. * Prices incl. dealers discount except as noted. # Add 4% sales tax. ## Add 2% intrastate sales tax. R Revised. † Plus 6% Mun & Prov tax.

CEMENT: •a Less 10¢ disc. 15 days. •b Less 2% disc. 15 days. •c Less 10¢ disc. 10 days. •d 10¢ disc. 20 days. •e Truckload lots. •f Fob mill, add $14.58 to $21.31 per car switching charges. •g fob mill + freight. •h LCL. •i Less 2% disc. 10 days. •j Truck lots. fob yard. •k 100 bag lots •l over 150 sacks. •m Sold in bags only. •n Less 5% disc. 30 days. •o Plus 50¢ for Sat. del. •p 5-8 ton truckload. •q F.o.b. mill •s In bags & bbl. Only •t min. 7 tons •u 200-bag lots

SAND, GRAVEL, STONE & SLAG: •a Truck lots. •b Per cu. yd. •c 5 tons up. •d Less 5¢ disc. 10 days. •e Less 2% disc. 10th. •f Less 2% disc. 15th. •g Less 5% for cash. •h Less than 5 tons. •j F.o.b. quarry. •k Barge lots asd. •l F.o.b. scow Hudson river. •m Less 2% for cash. •n F.o.b. cars. •q F.o.b. yard. •r less 5% disc. 15th. •s Less 2% disc. 10 days. •t Less 10¢ disc. 10 days. •u Less 5¢ disc. 10 days. •v Less 2% disc. 15 days. •w Less 10¢ disc. 15 days. •x Incl. 35¢ switch. charge. •y F.o.b. dock. •z 5-8 tons. •aa Less 5% disc. 15 days. •bb Less 2% 25th of month •cc F.o.b. plant cl •dd F.o.b. plant tl

CONCRETE BLOCK: •a Cinder. •b Waylite. •c Haydite. •d Celocrete, •e 5¼ x 8 x 12 in. •f 8 x 4 x 16. •g F.o.b. truck at job. •l F.o.b. plant San Rafael. •m F.o.b. yard. •n 8 x 8 x 18. •o Less 2% disc. 10 days. •p Less 2% disc. 10th. •q Less 5% disc. 10th. •r Less 2% disc. 15 days. •s Less 2% disc. cash. •t Siporex, 7 x 8 x 18. •u Less 5% disc. 10 days. •v Less 12% disc. 15th. •w Made to order.

READY MIXED CONCRETE: •a 6 cu yd or over del. Man. •b 25 cu yds or more •c 10–100 cy. •d 1–3 mi. zone add 15¢ for ea. add'l 1-mi. zone. •e 3,000 lb comp •f 2,500 lb. comp., less 5% disc. 30 days. •g Less 25¢ disc. 15 days. •h Less 50¢ for cash. •i 5% off for cash. •j 2% off for cash. •k Federal tax included. Add 6% mun. & prov. tax. •l 1:2½:3½ base price. •m F.o.b. yard. •n Plus escalator clause. •o Less 2% disc. 15 days. •p Less 50¢ disc. 15 days. •q Less 2% disc. 10 days. Add 50¢ per zone. •r 2000 wgt. •s Less 5% disc. 10 days. •t Incl. 50¢ heating. •u Less 2% disc. 15th. •v Sat. del.+50¢. •w 10-100 cy. •x Del in zone 20-B. •y less 25¢, 10 days. •z less 1% in 30 days. •aa 6 bag mix

CURRENT MAXIMUM PRICES AT CEMENT MILLS: Subject to 10¢ discount, 15 days. For paper bags add 50¢ per bbl., not refundable. *Prices guaranteed through December 31, 1960*

	Bulk		Bulk		Bulk		Bulk		Bulk
Richard City, Tenn	$3.55	Buffington, Ind	$3.55	Steelton, Minn	$3.60	Muskegon, Mich	$3.55	Toledo, O	$3.60
Clinchfield, Ga	3.55	Independence, Kan	3.35	Leeds, Ala	3.40	Saginaw, Mich	3.60	Milwaukee, Wis	3.50
Kingsport, Tenn	3.55	Hannibal, Mo	3.50	Duluth, Minn	3.60	Wyandotte, Mich	3.60	Green Bay, Wis	3.50
West Des Moines, Iowa	3.60	Northampton, Pa	3.50	Hudson, N. Y	3.50	Buffalo, N. Y	3.55	Ironton, O	3.55
Nazareth, Pa	3.50	Universal, Pa	3.60	Alpena, Mich	3.50	Oswego, N. Y	3.60	Montreal, Can	2.81
Bath, Pa	3.50	Waco, Tex. (+ 10¢ tax)	3.35	Detroit, Mich	3.60	Cleveland, O	3.65	W. Winfield, Pa	3.60
Lesley, Pa	3.50	Giant, S. C	3.55	Howes Cave, N. Y	3.50	Alsen, N. Y	3.50	Security, Md	3.50

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F. O. B. CITY

	PAVING BRICK AND BLOCK			PAVING ASPHALT Per ton, less than 80 penetration		ASPHALT BINDERS—FLUXES Per gal., 80–300 penetration		CUTBACK ASPHALT MC per ton		ROAD OIL	ASPHALT EMULSION RSI Per gal.	
	Granite Per M lots of 50,000 4x4x8 in.	Brick per M 3x4x8½ in. carload lots	Wood per sq. yd. 3½ in. 16-lb. treat	Tank car	Drums	Tank car	Drums	Tank car	Drums	Per gal. Tank car	Tank car	Drums
Atlanta	e	e	e	$28.70PS	$45.00PS	$0.2740PS	$0.235S	$0.1308wS	$0.245wS	$0.1258S	$0.1328S	$0.245
Baltimore	e	e	e	21.00i	....	.09i	0.18	.09iwE	.18iwE	.095	.10i	0.19i
Birmingham	......	66.00i	......	25.12	25.69O	.1069	0.1093O	.1162w	.1188Ow	.1006O	.1069	0.1093O
Boston	......	......	......	22.00apS	46.00apS	22.00anS	46.00anS	.105awF	.22awF	.14aOR	.15OR	......
Chicago	150.00‡a	95.00‡ab	3.95/4.00‡aj	22.00b	32.00b	20.40bv	30.40bv	.10bwH	.18bwH	.08b	......	......
Cincinnati	......	......	......	26.00SU	......	26.00ff	......	.1165wSU	......	.109	.1265	......
Cleveland	......	89.50‡d	6.30	26.00tA	......	26.00tvA	......	.1165twAF	......	......	.1265tA	.21A
Dallas	e	40/80p	e	26.90	46.35	.1138	.1983	30.50	52.45	.1100	.1138	.1983
Denver	......	62.00s	......	......	......	......	......	......	......	......	......	......
Detroit	......	114.00	......	31.50R	......	32.20vR	......	30.24wIR	......	27.84	.	.24
Kansas City	e	e	e	18.75cl	......	18.75cl	......	.0875J	......	.0675c	0.10	......
Los Angeles#	e	e	e	19.00dmx	......	19.00dvx	......	20.50dKx	......	19.50dvaa	21.40jXv	.1842jXv
Minneapolis	......	......	3.73h	23.70	......	23.70v	......	.105w	......	0.95	.1375bb	..
Montreal	e	e	e	30.50n	43.60n	.167n	.211n	17.80nuE	22.20nuE	.155n	.242n	.27nX
New Orleans	e	e	e	20.00e	......	20.00ev	......	.095ew	......	.085eB	.095eBL	.1905eB
New York	......	......	3.70f	20.99mO	42.95mO	20.99vtO	42.94vtO	9.61uF	19.01uF	......	9.68u	19.11u
Philadelphia	......	......	......	21US	......	21US	......	.095UwS	......	.095US	......	......
Pittsburgh	60.00k	95.00n	6.35n	31.20is	......	31.20isv	......	.1403‡S	......	.14‡S	.1403i	....
St Louis##	......	......	......	19.74f	21.65	.1825f	.1825	.09fw	.092fw	0.165f	.1825O	.30R
San Francisco	......	70.00	......	22.50gdd	41.00gdd	22.50gkvdd	40.00gkvdd	22.50gNdd	46.50gNdd	23.25gvWdd	23.50gvXdd	.2023gXdd
Seattle	......	......	......	24.00s	47.00h	33.00vscc	38.50	25.50KE	......	28.75hvY	25.80hvX	49.80hrvX
Toronto	......	120.00f‡	4.50f	38.90	59.01ee	0.2075	0.2773ee	0.222w	0.2704wee	0.233	0.212Zee	.268Zee

‡ Delivered. # Add 4% sales tax. ## Add 2% intrastate sales tax. R Revised.

PAVING BRICK & BLOCK: •a Less 2% disc. 10th. •b 3 x 3¾ x 8. •c 2¼ x 8¼ x 4. •d Truckload lots. •e Not used. •f 2" interior 6 lb tr. •g Less $1/Mdisc. 15th. •h 2" tr. 8 lb. •i 3 x 3⅝ x 8½. •j 2½", 6 lb. tr. •k Used. •l Redshale. •m Pine: oak $6.57. •n Truck del. •o Less $1/M disc. 15 days. •p Used: $40: new: $80.

ASPHALTS: •a F.o.b. refinery, Everett, Mass. •b F.o.b. refinery, Lockport, Ill. •c F.o.b. Sugar Creek, Mo. •d F.o.b. refinery, El Segundo. •e F.o.b. Baton Rouge. •f F.o.b. Hartford, Ill. •g F.o.b. refinery, Richmond, Calif. •h F.o.b. Martinez. •i F.o.b. refinery, Baltimore. •j F.o.b. refinery, Inglewood, Calif. •k 50–110 penetr. •l Less than 100 penetr. •m 40/300 penetr. •n F.o.b. refinery, Montreal. Fed. tax included; add 6% for mun. & prov. •o Drums not avail. Shipped in steel bbl. •p 60/70 penetr. •r In customer's drums. •s Shipped in drums, per drum. •t 150/300 penetr. •u Per 100 gal. •v Per ton. •w Per gal. •x Also tank trucks •y F.o.b. Oakland. •z F.o.b. Edmonds. •A F.o.b. refinery, Cleveland, •B F.o.b. Destrehan, La. •E RC. •F Also RC. •G Also MS •H RC 0–5 incl. •I MC 4. •J MC, RC $0.095. •K MC 3, 4, & 5. •L MS. •M MC 1–5, RC 1–5, $0.0918. •N MC 3. •O Truckload. •P F.o.b. refinery, Atlanta. •Q F.o.b. Eldorado, Ark. •R Delivered within 50 mi. •S Less 2% disc. 10 days, net 30. •T Less 1% disc. 10 days. •U F.o.b. refinery. •V Less 2% disc. 15 days. •W SC 2. •X RS 1. •Y SC 1. •Z Incl. 10% Sales Tax. •aa SC 3, 4, & 5. •bb RS 3. •cc In used drums. •dd Less disc of $1 ton. ee 45 Imp. gal. drums •ff 60-150 penetration

See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, Nov. 24; Next, Dec. 15.
- Clay Products, Lime, Plaster, Paint, Roofing: Last, Dec. 1; Next, Dec. 22.
- Wage Rates, Building Board Insulation: Last, Dec. 1; Next, Dec. 22.
- Iron & Steel Products, Pipe: Last, Nov. 17; Next, Dec. 15.

New rear dump hauls 15% more payload — *built entirely from USS "T-1" Steel.* This Athey PR 619 T-line trailer hauls 25 tons but weighs only 19,260 pounds. One man can move more tons of material, less fuel is consumed when running empty, and the machine has a faster cycle. The big improvement in performance starts with the use of USS "T-1" Steel *throughout*. This "strong boy" of metals cuts dead weight, substitutes 15% extra payload. Tougher, it defies relentless abuse, adds life. USS "T-1" Constructional Alloy Steel has a minimum yield strength of 100,000 psi. It is weldable and has high resistance to impact abrasion and corrosion. What's more, it retains its toughness at temperatures even down to 50 below zero. This combination of properties permits design for maximum weight savings coupled with ability to take abuse. In addition to "T-1" Steel, United States Steel makes other brands of steels for a wide variety of applications: USS COR-TEN, USS MAN-TEN and USS TRI-TEN with a 50,000 psi minimum yield point, in addition to a complete range of carbon and stainless steels.

USS, "T-1", COR-TEN, MAN-TEN and TRI-TEN are registered trademarks

Watch United States Steel's special Christmas show, **The Coming of Christ,** in Color on NBC-TV, Wednesday, December 21, 8:30 P.M., E.S.T.

United States Steel Corporation — Pittsburgh
Columbia-Geneva Steel — San Francisco
National Tube — Pittsburgh
Tennessee Coal & Iron — Fairfield, Alabama
United States Steel Supply — Steel Service Centers
United States Steel Export Company

USS

United States Steel

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, MARIE MORAVSIK, ELEANOR QUERET, Reports, J. H. WEBBER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
December 14 Maine & Canada
STREETS AND ROADS
December 14 Maine

HEAVY CONSTRUCTION—LB & CA

▲† **Franchi Constr. Co., Inc.**, 216 Webster St., Newton, Mass., CA **$2,157,620,** addnl. facilities BOMARC launcher shelters, technical bldgs. and utilities extension, Otis Air Force Base, FALMOUTH, MASS. U. S. Eng., 424 Trapelo Rd., Waltham, Mass. Bids Oct. 19. CD 10/24, under LB.

▲ **CONNECTICUT**—State Hy. Comr., 170 Douglas St., Hartford, Bids opened 11/28,
Conn.—**Enfield Road Constr. Co., Inc.**, P. O. Box 368, Thompsonville, Conn., LB **$2,068,944,** (9 bidders), 15,800 ft. hot b. conc. pavement on relocation of Rte. 12, and construction of 5 bridges. Projs. 68-93, Federal Aid Proj. F-159(2), Killingly;
Conn.—**D. V. Frione & Co., Inc.**, 87 Foxon St., New Haven, Conn., LB **$1,917,413,** (12 bidders), 2,779 lin. ft., 3½ in. hot b. conc. pavement on extension of Danielson connector, Rte 12, incl. 4 bridges, 3,000 lin. ft. 2½ in. hot b. concrete pavement on widening Rte US 6, Projs. 68-70 and 68-97, Federal Aid Projs. F-159(1) and F-8(7), Killingly. CD 11/25.

▲† **Psaty & Fuhrman, Inc.**, 369 Lexington Ave., New York, N. Y., CA **$4,030,000,** Item 1, 3 story, penthouse, H-type, 197 x 417 ft. anti-submarines research bldg., underwater sound laboratory, Fort Trumbull, NEW LONDON, CONN. Dist. Pub. Wks. Office, Third Naval Dist., Federal Office Bldg., 90 Church St., New York, N. Y. Bids Oct. 20. CD 10/25, under LB.

BUILDINGS—LB & CA

▲ **Palmet Tarinelli Constr, Co., Inc.**, 144 Island Brook Ave., Bridgeport, Conn., Owner Builds, **$2,520,000,** 304 units, Garden APARTMENTS, Reservoir Ave., BRIDGEPORT, CONN. CD 11/2.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
December 20 Maryland
STREETS AND ROADS
December 14 Delaware, New Jersey
December 16 Pennsylvania December 22 New Jersey

BUILDINGS—BA

▲ **N. Y., New York**—SUPERSTRUCTURE, TELEPHONE EXCHANGE—BA 12/16—New York Telephone Co., 140 West St., New York 7, superstructure for 21 story Telephone Exchange and Office, 789-813 Tenth Ave. Total cost $13,000,000. CD 3/24.

▲ **Pa., Phila.**—MEDICAL RESEARCH—BA 12/22—Temple University, Broad and Berks St., medical research bldg. $8,000,000. Nolen & Swinburne, 226 S. 16th St., archts. Severud, Elstad, Krueger Assocs., 415 Lexington Ave., New York, N. Y., engrs. CD 3/18.

† **Pa., Phila.**—POST OFFICE REMODELING, etc.—BA 1/10—General Services Admin., 250 Hudson St., New York, N. Y., post office and court addn., extension, remodeling, $7,000,000. Ballinger Co. & Harry Sternfeld, 1625 Race St., Phila., Pa., archts. CD 9/16.

▲ **N. Y., Brookhaven** — VISITING SCIENTIST QUARTERS—BA On Or About 1/17—U. S. Atomic Energy Comn., Brookhaven National Laboratory, Upton, 4 story, concrete block visiting scientist quarters bldg. to contain 16 individual housing units, etc., Brookhaven National Laboratory, Upton. Plans deposit $25. Carl B. Stoye, 52 Main St., Sayville, archt. CD 10/26/55.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK** — State Hy. Dpt., State Office Bldg., Albany,
Brunalli Constr. Co., 109 Summer St., Southington, Conn., CA **$4,939,509,** c. conc. pavt. 1.49 mi. (4.24 mi. acc.) Hy. RR gr. sep. comp. I-beam 5 sp. 300.3 ft. total, repairs to exist. bridge over D. L. & W. R.R., H. G. S. comp. I-beam 4 sp. 207.5 bridge-welded pl. gird. etc. Vestal-Vestal Center-Choconut SH 8331 Vestal, SH 420 Union Village, Main and Bridge Sts., SH 5412 Endicott, SH 174, Rtes. 26 and 17C, FARC 60-177, Proj. U-UG-482(3), Broome Co. CD 10/21, under LB.

▲ **The Forest Co.**, R. D. 1, Mechanisburg, Pa., CA **$2,848,545,** imprv. Seaside Blvd., Winfield St. to Fort Wadsworth, Contr. 2, Richmond Boro, NEW YORK. President Richmond Boro, Boro Hall, St. George, S. I., N. Y. Bids July 25, awarded Nov. 16. CD 7/29, under LB.

▲ **Hendrickson Bros., Inc.**, 63 No. Central Ave., Valley Stream, N. Y., LB **$3,672,538,** (4 bidders), Contr. 1002-2-AW-3, lateral sewers, Albertson, Searingtown and vicinity Albertson, MINEOLA, N. Y. County of Nassau, Old County Court House, Franklin Ave., Mineola, N. Y., Bids Nov. 29. CD 11/3.

▲ **PENNSYLVANIA**—State Hy. Dpt., Harrisburg, Bids opened 11/18,
Glasgow, Inc., Willow Grove Ave. and Limeklin Pike, Glenside, Pa. LB **$2,265,762,** (9 bidders), divided hy rein-con. pvt. 24 ft. wide, each side of earh median variable in width, 5.58 mi., Traffic Rte. 3, between West Chester and Newtown Square, 5 bridges, Chester and Delaware Counties. (**Correction-low bidder**). CD 11/23, under LB.

▲ **MARYLAND**—State Rds. Comn., 300 W. Preston St., Baltimore, Zone 3,
Williams Constr. Co., Golden Ring Rd. and Pulaski Hy., Baltimore, Md., CA **$3,993,706,** grade, drain, surf. 4.33 mi. Baltimore Beltway Rte. 40 to Liberty Rd., incl. 4 four span steel beam bridges, 1-3 span bridge, 5 rein.-con. box culverts, Baltimore Co. Bids Oct. 25. CD 10/27, under LB.

BUILDINGS—LB & CA

▲ **Caristo Constr. Corp.**, 26 Court St., Brooklyn 1, N. Y., CA **$3,340,000,** combination PUBLIC SCHOOL 79, Madison Ave. and E. 117 St., and PUBLIC SCHOOL 181, Essex, Norfolk and Stanton Sts., Manhattan Boro, NEW YORK, N. Y. Deputy Supt. Schools, Bureau Constr., 4 Floor, 42-15 Crescent St., Long Island City 1, N. Y. Bids Nov. 4, awarded Nov. 25. CD 11/10, under LB.

▲ **M. S. Kelliher Co.**, 10 Tremont St., Boston Mass., LB **$2,777,000,** (4 bidders), general contract, Stage II, Midtown Plaza UNDERGROUND GARAGE, ROCHESTER, N. Y. City, City Hall, Rm. 36, 20 South Fitzhugh St., Rochester, 14, N. Y. Bids Nov. 23. CD 11/21;
Horacek-Hayden, Inc., 250 Mt. Hope Ave., Rochester, N. Y., LB **$184,256,** (2 bidders), electrical work for Underground Garage (Rochester, N. Y.);
Howe & Bassett Co., Inc., 840 University Ave., Rochester, N. Y., LB **$203,800,** (2 bidders), heating and ventilating Underground Garage (Rochester, N. Y.).

▲ **E. I. duPont deNemours & Co.**, duPont & Nemours Bldg., Wilmington, Del., Owner Builds, PLANT to produce Teslar for surfacing building siding, TONAWANDA, N. Y.

▲ **Caristo Constr. Corp.**, 26 Court St., Brooklyn 1, N. Y., CA **$1,630,000,** general contract PUBLIC SCHOOL 154, Alexander Ave. between E. 136 St. and Major Deegan Blvd., Bronx Boro, NEW YORK, N. Y. Deputy Supt. Schools, Bureau Constr., 4 Floor, 42-15 Crescent St., Long Island City 1, N. Y. Bids Nov. 3, awarded Nov. 25. CD 11/9, under LB.

▲ **George Wicks, Willowbrook** Rd., Holmdel, N. J., Owner Builds, **$3,500,000,** 125 HOUSES off Rte. 520, HOLMDEL, N. J. Wm. Chirgotis, 80 Morris Ave., Springfield, N. J., and Herman York, 90-04 161 St., Jamaica 32, N. Y., archts. CD 5/25.

▲ **George A. Fuller Co.**, 597 Madison Ave., New York 22, N. Y., CA Est. **$5,000,000,** DEPARTMENT STORE, PARAMUS, N. J. Alexander's 225 W. 34 St., New York 18, N Y. Lathrop Douglass, 518 5 Ave., New York 18, N. Y., archt. Sidney Barbanel, 29-46 Northern Blvd., Long Island City 1, N. Y., mechanical engr. Severud-Elstad & Krueger, 415 Lexington Ave., New York 17, N. Y., structural engrs. Awarded Nov. 15. CD 9/7.

▲ **R. M. Shoemaker Co.**, 245 S. 24th St., Phila., Pa., CA **$16,000,000,** 776 unit APARTMENT, 25th St. and Fairmount Ave., PHILA., PA. 2401 Pennsylvania Ave. Corp., Rm. 2100, Market St. National Bank Bldg., Phila., Pa. CD 2/17.

▲ **Carl M. Freeman**, 1111 Fidler Lane, Silver Spring, Md., Owner Builds, **$3,000,000,** 301 units garden type APARTMENTS, Chesapeake and Bay Ridge Aves., ANNAPOLIS, MD.

▲ **Cafritz Constr. Co.**, 1625 Eye St. N. W., Wash., D. C., CA **$2,380,000,** Lincoln Branch BANK, 17th and H Sts. N. W., WASH., D. C. Riggs National Bank, 1530 Pennsylvania Ave, N. W. Wash., D. C., CD 11/23, under LB.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
December 15 Florida December 16 Alabama, Kentucky
STREETS AND ROADS
December 13 South Carolina, West Virginia
December 16 Alabama, Kentucky

▲† **Florida**—BA About 12/21—U. S. Eng., P. O. Box 970, Jacksonville, modifying and deepening entrance channel and turning basin, Broward Co. at adjoining city limits of Fort Lauderdale and Hollywood, on lower east coast of Florida, CIVENG-08-123-61-34. $4,000,000. CD 9/21.

▲ **Ky., Lexington** — BA 1/10 — City, Municipal Bldg., sewage treatment plant expansion to treat hydraulic flow of 12,000,000 gal. per day. $3,000,000. Plans deposit $100. J. Stephen Watkins, 446 E. High St., engr. CD 10/10.

BUILDINGS—BA

▲ **S. C., Greenwood**—PLANT—BA 12/15—Parke, Davis & Co., Joseph Campau Ave. at River, Detroit, Mich. (selected list of bidders), surgical gauze mfg. plant, $5,000,000. Lockwood Greene Engineers, Inc., 1020 Montgomery Bldg., Spartanburg, archt. CD 3/15.

HEAVY CONSTRUCTION—LB & CA

▲ **ALABAMA**—State Hy. Dpt., Montgomery, Zone 4, Bids opened 11/18,
Ala.—**Southern Roadbuilders, Inc.**, 2312 Ada Ramp Waldn Rd., Augusta, Ga., LB **$2,347,564,** base and conc. paving, 10.105 mi. from U. S. 11 near Fort Payne NE to Rodgers on Inter Rte 59, DeKalb Co.;
Ala.—**Claussen-Lawrence Constr. Co.**, 1394 Gwinnett St., Augusta, Ga., LB **$1,607,262,** base and conc. paving 6.546 mi. from Rodgers Rd. NE to Georgia state line in Inter Rte 59, DeKalb Co.;
Ala.—**Hewitt Contr. Co.**, 1509 3rd Ave., Columbus, Ga., LB **$504,594,** grading, bit. paving 1.815 mi. US 431 in Eufaula, Barbour Co.;
Ala.—**George A. Dozier**, 4144 Wares Fy Rd., Montgomery, Ala., LB **$1,982,938,** base and bit. paving, 3.291 mi. from US 90 N. to Old Shell Rd. on Inter Rte 65, Mobile Co. CD 10/7.

BUILDINGS—LB & CA

▲ **Robert Chuckrow Constr. Co.**, 60 E. 42 St., New York 17, N. Y., Owner Builds, **$3,250,000,** 126 units, 15 story cooperative APARTMENT, CLEARWATER, FLA. C. Dale Dykema Assocs., 1000 58th St. N., St. Petersburg, Fla., archts.-engrs.

▲ **Taylor Constr. Co.**, 2875 N.W. 42nd Ave., Miami, Fla., LB **$15,483,000** Alternate 1, LB **$13,921,000** Alternate 2, TRADE & CULTURAL CENTER, incl. dredging, fill, bulkhead, paving, water and sewer lines, exhibition building, MIAMI, FLA. Inter-American Center Auth., Miami International Airport, Miami, Fla. CD 10/31, under Earthwork, etc.

▲ **Bechtel Corp.**, 220 Bush St., San Francisco, Calif., CA Total cost **$39,000,000,** Big Sand STEAM-ELECTRIC GENERATING PLANT near Louisa, KENTUCKY.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $53,000; other public works $88,000; Industrial buildings $110,000; other buildings $400,000. Also Foreign projects of $1,000,000 and more in size of Interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED
New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	**Federal Government**
▲	**Project of $1,000,000 or over.**
ENR	**Engineering News-Record**
CD	**Construction Daily**

For additional reports see Construction Daily.

Kentucky Power Co., 15 St. and Carter Ave., Ashland, Ky. American Electric Power Corp., 2 Broadway, New York 8, N. Y., engrs. CD 8/2, under CA.

▲ **Huber, Hunt & Nichols, Inc.**, 2450 Stibbs Ave., Indianapolis, Ind., CA Est. **$3,500,000**, 4 story, 150,000 sq. ft. brick OFFICE, OWENSBORO, KY. Texas Gas Transmission Co., 3 and Locust Sts., Owensboro, Ky. Bids Nov. 15. CD 11/17.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

December 15 Ohio December 29 Wisconsin & Minnesota

BUILDINGS—BA

▲ **Ill., Chicago**—HOMES—BA 12/15—Chicago Housing Auth., 608 S. Dearborn St., CHA Proj. Ill. 2-30, Stage II, two 16 story, elevator type apartments, underground utilities, site imprvs., W. Scott St., N. Ogden Ave., N. Clybourn Ave. and N. Larrabee St. Extended date. Pace Assocs., 53 W. Jackson Blvd., Zone 4, archts.-engrs. CD 11/10.

▲ **Ill., Springfield**—MUSEUM—BA 12/20—State, Capitol Bldg., state museum, $2,350,000. J. D. Jarvis, Rm. 200, State Armory, state archt. CD 4/27/59.

▲ **O., Cincinnati**—SCHOOL—BA 12/21—Bd. Educ., 608 McMillan St., Eden Junior High School, $1,800,000. Plans deposit $50. Cordes, Pressler & Houck & Assocs., archts., and Al Buenger, engr., both 4939 Paddock St. CD 3/9/59.

▲ **Ill., Rockford**—Hospital—BA 1/8—St. Anthony's Hospital, 1411 E. State St., hospital. $4,500,000. Walter Butler Co., Minnesota Bldg., St. Paul 1, Minn., archt.-engr. CD 10/10.

BUILDINGS—SLC

▲ **Ill., Chicago**—EXHIBITION HALL—Conrad Hilton Hotel, 720 S. Michigan Ave., soon lets contract exhibition hall, 741 S. Wabash Ave., $2,000,000. Holabird & Root, 180 N. Wabash Ave., Zone 1, archts.

HEAVY CONSTRUCTION—LB & CA

▲ **MICHIGAN**—State Hy. Dpt., 732 Mason Bldg., Lansing,

L. W. **Edison Co.**, 3134 Midland Dr. S.E., Grand Rapids, Mich., CA **$1,553,367**, 1.052 mi. dual 36 ft. concrete pavt. and two bridge structures on U. S. 131, Grand Rapids, Kent Co.; CA **$1,941,406**, 0.732 mi. dual 36 ft. concrete pavt. and two bridge structures on U. S. 131 relocation, Grand Rapids, Kent Co. Bids Nov. 2, awarded Nov. 15. CD 11/9, under LB.

BUILDINGS—LB & CA

▲ **Jack Seyferth**, 5049 Crookshanks St., Cincinnati, O., CA first section MOTEL addn., CINCINNATI, O. Carrousel Motel, Inc., Reading Rd., Cincinnati, O. Bids Nov. 2. CD 10/20.

▲ **Taylor & Gaskin, Inc.**, 6440 Mack Ave., Detroit, Mich. CA, steel and erection contract for 214,000 sq. ft. steel, brick, aluminum BODY MFG. PLANT addn., HAMILTON, O. Fisher Body Div., General Motors Corp., General Motors Bldg., Detroit, Mich. CD 11/30.

▲ **Carl E. Erickson Co.**, 4657 N. Ravenswood Ave., Chicago, Ill., CA **$6,000,000**, 27 story, 62 x 200 ft. rein.-con. APARTMENTS, 215 E. Chicago Ave., CHICAGO, ILL. George S. Lurie, 120 S. LaSalle St., Chicago, Ill. CD 3/24.

▲ **Gust K. Newberg Constr. Co.**, 2040 N. Ashland Ave., Chicago, Ill., CA **$7,186,000**, 631 unit Robert R. Taylor HOMES, Housing Proj. 2-37, Stage I, CHICAGO, ILL. Chicago Housing Authority, 608 S. Dearborn St., Chicago 5, Ill. Bids Nov. 8, awarded Nov. 21. CD 11/10, under LB.

▲ **S. N. Nielsen Co.**, 3059 W. Augusta St., Chicago, Ill., LB **$5,897,000** (4 bidders), three buildings, WASHINGTON PARK HOMES, Proj. 2-34, CHICAGO, ILL. Chicago Housing Auth., 608 S. Dearborn St., Chicago, Ill. Bids Nov. 29. CD 10/7.
Paschen Contractors, Inc., 2739 N. Elston St., Chicago, Ill., LB **$7,890,000** (4 bidders), four buildings WASHINGTON PARK HOMES, Proj. 2-34 (Chicago, Ill.).

▲ **Felmley Dickerson Co.**, 311 E. Lafayette St., Bloomington, Ill., LB **$2,657,000**, DORMITORY and DINING HALL, Northern University, DE KALB, ILL. State Teachers College, State Office Bldg., Springfield, Ill. Bids Nov. 3. CD 9/29.

▲ **George A. Fuller Co.**, 111 W. Washington St., Chicago, Ill., and **Turner Constr. Co.**, 105 W. Adams St., Chicago, Ill., CA **$18,000,000**, SHOPPING CENTER, incl. Montgomery Ward & Co., Carson, Pirie & Scott Wieboldt Stores, Inc., MT. PROSPECT, ILL. Randhurst Shopping Center, corner Rand Rd. and Elmhurst Rd., Mt. Prospect, Ill. CD 5/27.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

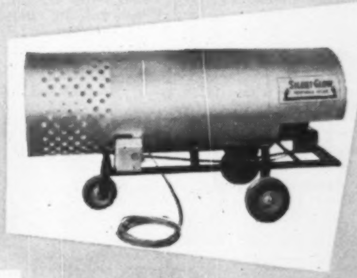
December 13 Iowa December 14 Arkansas, Wyoming
December 15, 20, 22 Kansas December 16 New Mexico
December 16 North Dakota December 16 North Dakota & Minnesota
December 20 Oklahoma December 29 South Dakota

from SILENT GLOW'S BIG THREE

LOTS OF CLEAN HEAT IN A HURRY!

SILENT GLOW's Model 300 oil-fired, lightweight, portable heater delivers safe, economical, dependable heat—INSTANTLY IN LARGE VOLUME . . . AT THE FLICK OF A SWITCH. 300,000 B.T.U.'s/hr. 1850 C.F.M. air delivery. Controls: Manual; switch and solenoid. Automatic—thermostat, M-H safety relay.

SILENT GLOW's Model 450 meets the need for a high capacity, lightweight space heater in such applications as large industrial building construction, foundations, bridge work, etc., anywhere that high velocity, high temperature air in great volume is vital. Fully portable. 450,000 B.T.U.'s/hr. 3,000 C.F.M. air delivery. Controls: Manual-switch and solenoid. Automatic-thermostat, M-H safety relay.



SILENT GLOW's Model M, the giant of the trio, does the really big heating jobs. Extremely mobile despite its size, the M is supported and easily moved by heavy-duty rubber tire wheels. Like other Silent Glow units, it offers 100% utilization of inexpensive fuels—kerosene, No. 1, No. 2. 1,000,000 B.T.U.'s/hr. 7,000 C.F.M. air delivery. Controls: automatic-thermostat, M-H safety relay.

For 38 years Silent Glow has been providing the building and construction trades with safe, clean, economical heat—instantly—in optimum volume whatever the job . . . spot and space heating . . . drying plaster, concrete, sand, other aggregates . . . thawing and starting machinery and other equipment . . . efficiency-increasing personnel comfort. One of the "Big Three" described above will do your heating job better than you've ever had it done before—a claim made possible by exclusive Silent Glow design features, and backed up by the superior performance of more than 50,000 Silent Glow heaters now in the field. Write for more information on this trio, or see them at your nearest Silent Glow dealer. Act today—tomorrow may be cold!

The SILENT GLOW CORPORATION
890 WINDSOR STREET, HARTFORD 1, CONNECTICUT

STREETS AND ROADS

December 13 Iowa December 14 Arkansas, Wyoming
December 15, 20, 22 Kansas December 16 Minnesota
December 16 New Mexico, North Dakota
December 20 Oklahoma December 29 South Dakota

▲ **Okla., Oklahoma City**—BA 12/15—Oklahoma City Municipal Imprvt. Authority, Municipal Bldg., Atoka Water Proj., incl. 98 mi. 48 or 60 in. concrete pressure pipe, pump stations, reservoir, filter plant, and connecting pipe lines. $56,000,000. Plans deposit $100. C. E. Bretz, 1916 N. Broadway, Oklahoma City, Okla., and Metcalf & Eddy, 1360 Statler Bldg., Boston, Mass., consult. engrs. Former contract cancelled. CD 4/19, under CA.

▲† **Arkansas**—BA 12/29—U. S. Eng., P.O. Box 867, Little Rock, design, manufacture, test and deliver four 51,800 hp. Kaplan type turbines, with draft tube liner, pit liner, draft tube pier nosings, appurtenant parts, and spar parts, Dardanelle Dam, CIVENG-03-050-61-32, Pope Co. $6,000,000. Bids Aug, 30 rejected. CD 9/2, under LB.

▲† **Oklahoma**—BA About 1/10—U. S. Eng., Box 61, Tulsa, surf., turfing State Hy. 51, Keystone Reservoir, ENG-34-066-61-37, $2,000,000. Plans deposit $10. CD 9/30.

▲ **Colo., Colorado Springs**—STADIUM—BA About 3/1—Air Force Academy Foundation, Inc., P.O. Box 1838, 40,000 seat rein.-con. stadium, Air Force Academy, $2,000,000. Praeger-Kavanagh-Waterbury, 126 E. 38 St., New York, N. Y., and Gordon Sweet, 119 E. Columbia St., Colorado Springs, Colo., archts. J. F. Jelley, 121 E. Vermijo St., engr. CD 6/6.

BUILDINGS—BA

▲ **Tex., Addicks**—RESEARCH OFFICE—BA 12/14—United Carbon Co., First City National Bank Bldg., Houston (selected list of bidders), 1 and 2 story, 80,000 sq. ft. A/C concrete frame Research Office, near here. $2,500,000. Skidmore, Owings & Merrill, 425 Park Ave., New York, N. Y., archts. Jaros, Baum & Bolles, 730 3rd Ave., and Weiskopf & Pickworth, 230 Park Ave., both of New York, N. Y., engrs. CD 2/23.

▲ **S. D., Rapid City**—ACADEMY, etc.—BA 12/21—Order of St. Benedict, Sturgis, St. Martins Academy and Motherhouse. $2,500,000. Mark Pfaller & Assoc., Inc., 7613 W. State St., Milwaukee, Wis., archt. CD 2/26.

HEAVY CONSTRUCTION—LB & CA

▲ **IOWA**—State Hy. Comn., Ames.

Cameron Joyce & Co., 19 S. 7th St., Keokuk, Iowa, CA **$2,059,692**, c. conc. paving 7.351 mi. Proj. I 29-6 (7)114, Monona Co.; CA **$1,949,946**, c. conc. pavement 6.684 mi. I 29-6(8)122, Monona and Woodbury Counties. Bids Nov. 15. CD 11/18, under LB.

▲ **TEXAS**—State Hy. Comn., Austin,

Tex.—**Dean Word Co.**, Box 330, New Braunfels, Tex., CA **$2,510,150**, grading, strs. base and b. conc. pvt., 7.122 mi. St. Hy. 6, Proj. E 258-9-29, McLennan Co.;

Tex.—**Uvalde Constr. Co.**, Box 10286, Dallas, Tex., CA **$534,230**, grading, storm sewers, and conc. pvt. 0.569 mi., Hy. US 287, Proj. U 3(12), Wichita Co. Bids Nov. 9, awarded Nov. 22. CD 11/14, under LB.

▲ **TEXAS**—State Hy. Comn., Austin,

William Bros. Constr. Co., Inc., Schwope Eng. Co., & Flenniken Constr. Co., Box 15066, Houston, Tex., CA **$2,915,523**, grading, strs., sewers, cem. stab. base and con. pvt. and signals, 2.328 mi. Proj. US 14 (36) & (37), Harris Co. Bids Nov. 10, awarded Nov. 22. CD 11/15, under LB.

▲ **William A. Smith Contg. Co., Inc.**, 1401 Fairfax Traffic Way, Kansas City 15, Kan., LB **$3,477,895**, est. $3,647,000 (13 bidders), Hubbard Creek Dam, Contract No. 1, near Breckenridge, TEXAS. West Central Texas Municipal Water Dist., Commerce Bldg., Abilene, Tex. Bids Nov. 30. CD 10/18.

BUILDINGS—LB & CA

▲ **M-C Constr. Co.**, 2713 Lakeport, Maryland Heights, Mo., CA Est. over **$3,000,000**, 600 RESIDENCES, Arrow Heights Subdivision, Midland Ave. north of St. Charles Rock Rd., MARYLAND HEIGHTS, MO. Morris Cohen, 2713 Lakeport, Maryland Heights, Mo.

▲ **H. A. Lott Constr. Co.**, P.O. Box 25005, Houston, Tex., LB **$3,069,469** (5 bidders), Juniper Gardens HOUSING, KANSAS CITY, KAN. City Housing Auth., 619 Ann St., Kansas City, Kan. Bids Nov. 29. CD 11/18.

▲ **Geo. A. Fuller Co.**, 940 Gibraltar Life Bldg., Dallas, Tex., CA **$5,497,500**, general contract, HOSPITAL, DALLAS, TEX. Saint Paul's Hospital, 3121 Bryan Ct., Dallas, Tex., Grand total $8,817,173, CD 10/6;

Natkin & Co., 2676 Brenner, Dallas, Tex., CA **$2,564,540**, mech. for hospital, (Dallas, Tex.); **Harmon Elec. Constr. Co.**, 4311 Belmont St., Dallas, Tex., CA **$755,133**, elec. for hospital, (Dallas, Tex.).

▲ **McMillan Home Builders**, 5331 Brookmeade St., Houston, Tex., Owner Builds, **$1,950,000**, 62 DWELLINGS, bordered on South by Buffalo Bayou, HOUSTON, TEX.

▲ **Pace Setter Homes, Inc.**, 6723 Glen Rock St., Houston, Tex., Owner Builds, **$4,262,000**, 180 DWELLINGS, Barkley Square North of Bray's Bayou, HOUSTON, TEX. CD 11/14.

▲ **Tom McGovern & Associates**, 535 Busby St., San Antonio, Tex., CA **$2,250,000**, 100 HOMES, McQUEENEY, TEX. Treasure Island, Inc., 123 Greenhaven St., San Antonio, Tex. CD 11/23.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS

December 16 Arizona December 21, 22 California
December 22 Hawaii January 4 California

▲† **Calif., San Diego**—DREDGING FOR CARRIER BERTH—BA 12/20—11th Naval Dist., 1220 Pacific Hy., San Diego 1, dredging for carrier berth facility, Naval Air Station, North Island, Spec. 25397. $1,000,000-$2,500,000. CD 9/8/58.

▲ **CALIFORNIA**—BA 12/21—U. S. Eng., 751 South Figueroa St., Los Angeles, Wilson Canyon and Mansfield St. Channels, Los Angeles River Basin, and debris bases Astoria St. to Pacoima Wash, San Fernando, CIVENG-04-353-61-109. $2,000,000. CD 9/20.

▲† **Wash., Seattle**—ADMINISTRATION and EXHIBIT—BA 1/10—General Services Admin., 909 1st Ave., Century 21 Exposition, administration and exhibit bldgs. for Dpt. Commerce. CD 2/5/60.

BUILDINGS—BA

▲ **Calif., Anaheim** — SCHOOL — BA 12/20 — Anaheim Union High School Dist., 123 North Citron Ave., Savannah High School. $2,081,000. CD 12/1/59.

▲ **Calif., Hanford**—TIRE PLANT—BA 1/10—Armstrong Tire & Rubber Co., 475 Elm St., West Haven, Conn., (selected list bidders) 1,000,000 sq. ft tilt-up rein.-con. tire manufacturing plant. $16,000,000. David H. Horn, 2016 Merced, Fresno, archt. CD 7/19.

BUILDINGS—SLC

▲ **Calif., Sunnyvale**—ENGINEERING and LABORATORY—Lockheed Aircraft Corp., Missile Systems, P.O. Box 504, soon lets contract 124,800 sq. ft., structural steel, frame, tiltup conc. panels, etc. laboratory and engineering plant annex. $4,000,000. CD 11/16.

HEAVY CONSTRUCTION—LB & CA

▲† **J. A. Jones Constr. Co., D. W. Winkelman Co., Inc., Nello-Teer Co.**, 209 W 4th St., Charlotte, N. C. CA **$27,770,000**, construction of Titan II Missile Launch Facilities, **Phase 1, Davis-Monthan Air Force Base**, TUCSON, ARIZ. U. S. Eng., Ballistic Missile Construction Office, 9610 Bellanca Ave., Los Angeles, Calif. CD 4/27.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento, Bids opened 11/30,

Grafe-Callahan Constr. Co., 714 West Olympic Blvd., Los Angeles, Calif., LB **$3,431,743**, (8 bidders), 1,835 ft. long, 26 ft. wide, two lane roadway and 2 ft. safety sidewalks in constr. of Oregon Mountain Tunnel, U. S. Hy. 199, Del Norte Co. CD 10/26.

▲ **CALIFORNIA**—State Div. Hy., 1120 N St., Sacramento, Bids opened 11/30,

Fredrickson & Watson Constr. Co. and Lew Jones, 873 81 Ave., Oakland, Calif., LB **$6,946,163**, (11 bidders), 2,800 ft. and 8,800 ft. bridges and 4,710 ft. earthfill between them to provide alignment across Yolo-By-Pass, Hy. 40 west of Sacramento, 5.7 mi. six lane freeway, Yolo Co. CD 10/19.

▲ **F. W. Case Corp., Hood Constr. Co., Hood Northwest Pipeline Co.** and **Hood Flexible Pipe Cleaning Co.**, Municipal Airport, Chico, Calif., CA **$2,982,965**, South Bay Aqueduct, 13,000 ft. Brushy Creek pipe line 10,000 ft. Dyer Canal, 12,000 ft. Altamont pipe line and 10,000 ft. section Livermore Valley Canal, units of Feather River Proj. and California Water Plan, Alameda Co., CALIFORNIA. State Dpt. Water Resources, 1120 N St., Sacramento, Calif. CD 10/24, under LB.

▲ **Connolly Pacific Co., Grafe-Calahan Constr. Co., Brayer Electric Co. & Chas. J. Harney, Inc.**, 575 Berry St., San Francisco, Calif., CA **$10,378,332**, third two-lane 3,371 ft. long, 28 ft. roadway 4 ft. sidewalk tunnel, Sign Rte. 24 through Berkeley Hills at Caldecott Tunnel at east city limit of Oakland, Alameda Co., CALIFORNIA. State Div. Hys., 1120 N St., Sacramento, Calif. Bids Nov. 16, awarded Nov. 25. CD 11/21, under LB.

▲ **American Pipe & Constr. Co.**, Box 630, Hayward, Calif., CA **$5,293,412**, 4 mi. 9 ft. diam. Lafayette Aqueduct No. 2, incl. six tunnels with total length of 1.2 mi., East Bay Municipal Utility District, OAKLAND, CALIF. East Bay Municipal Utility Dist., 2130 Adeline St., Oakland, Calif. CD 1/22/59.

BUILDINGS—LB & CA

▲ **Branagh, Inc.**, 42 LaSalle Ave., Piedmont, Calif., CA **$3,871,000** MARRIED STUDENTS HOUSING, Gill Tract for University of California Campus, Berkeley, ALBANY, CALIF. Regents of University of California, Office of Archts. & Engrs., 2 Barrow Lane, Berkeley, Calif. Public Structures, Inc., Wurster, Bernardi & Emmons, 202 Green St., San Francisco, Calif., archts. Wm. B. Gilbert & Assoc., 150 Green St., San Francisco, Calif., engrs. Awarded Nov. 21. CD 1/2/58, under Calif., Berkeley.

▲ **Brightwood Constr. Co.**, 8929 Wilshire Blvd., Beverly Hills, Calif., CA **$2,636,180**, 261 DWELLINGS, Tracts 23894, 23896, 23897, 23898, 23899, GRANADA HILLS, CALIF. Vista Park Homes, Inc., 8929 Wilshire Blvd., Beverly Hills, Calif.

▲ **J. G. Watts Constr. Co.**, 672 South Lafayette Park Pl., Los Angeles, Calif., LB **$5,614,520** (6 bidders), 5 story, 292,000 sq. ft., 5,000 STUDENT CLASSROOM, BLDG. No. 1, Los Angeles State College, W.O. 4304GC-26, LOS ANGELES, CALIF. State Div. Architecture, 1100 South Grand Ave., Los Angeles, Calif. Bids Nov. 23. CD 10/21.

▲ **Elmwood, Inc.**, P. O. Box 187, Danville, Calif., Owner Builds, **$2,165,100**, 184 DWELLINGS, PLEASANTON, CALIF.

▲ **M & K Corp.**, 519 California St., San Francisco, Calif., LB **$4,032,000**, (6 bidders), 3 story, bsmnt., rein.-con. Southeast SENIOR HIGH SCHOOL, Mansell and Somerset Sts., SAN FRANCISCO, CALIF. City and San Francisco County, Dpt. P. Wks., City Hall, San Francisco, Calif. Gardner A. Dailey, 442 Post St., San Francisco, Calif., archt. CD 1/16/57.

▲† **Gerston Constr. Co.**, 8530 Wilshire Blvd., Beverly Hills, Calif., LB **$9,270,000**, 600 unit Capehart HOUSING, incl. utilities, sewage, etc. Proj. IFB 61-1, TRAVIS AIR FORCE BASE, CALIF. Base Procurement Office, Cannon Dr., Travis Air Force Base, Calif. Angus McSweeney, Inc., 2960 Van Ness Ave., San Francisco, Calif., archt.-engr. Bids Nov. 16. CD 11/7.

▲ **Nordic Constr. Co.**, 685 Ahua St., Honolulu, Hawaii CA **$2,669,000**, 17 story, 126 unit COOPERATIVE APARTMENT, resident parking, pool, HONOLULU, HAWAII. Seaside Tower Development Inc., 436 Nohonani St., Honolulu, Hawaii. Edwin L. Bauerl, 1521 South King St., Honolulu, Hawaii, archt. Awarded Nov. 25.

CANADA

BUILDINGS—BA

▲ **Man., Winnipeg** — ADMINISTRATION — BA 12/20—Manitoba Telephone System, 166 Portage Ave. E., 6 story administration bldg. $4,000,000. Plans deposit $100. Smith, Carter, Searle & Assocs., 65 Dewdney Ave., archts. CD 4/20.

HEAVY CONSTRUCTION—LB & CA

▲ **Commonwealth Constr. Co., Ltd.**, 300 Royal Bank Bldg., Winnipeg, Man., LB **$9,061,382**, (14 bidders), Air Terminal bldg., Winnipeg International Airport, WINNIPEG, MAN. Dpt. Transport, Hunter Bldg., Ottawa, Ont. Bids Nov. 25. CD 11/9.

▲ **QUEBEC**—Dpt. P. Wks., Parliament Bldgs., Quebec City,

Dufresne Engineering Co., Ltd., 1832 Pie IX Blvd., Montreal, Que., CA **$2,308,754**, 1,900 ft. Honore Mercier Bridge 27 ft. wide over St. Lawrence River between LaSalle and Caughnawaga, Ville LaSalle. Bids Sept. 29, awarded Nov. 22. CD 10/21 under LB.

BUILDINGS—LB & CA

▲ **Christensen & MacDonald Ltd.**, 612 Tegler Bldg., Edmonton, Alta., CA **$9,249,429**, ACTIVE TREATMENT BLDG., 102nd St. at Kingsway Ave. Royal Alexandra Hospital Bd., EDMONTON, ALTA. City, City Hall, Edmonton, Alta. Bids Oct. 26. CD 11/10, under LB.

▲ **Ain & Zakuta Ltd.**, 6910 Wiseman Ave., Montreal, Que., CA Est. **$2,500,000**, SHOPPING CENTRE, MONTREAL, QUE. Northview Shopping Centre, corner de Salaberry St. and Laurentian Autoroute, c/o Maxwell Cummings & Sons 1390 Sherbrooke St. W., Montreal, Que. Ian Martin & Victor Prus, 4693 Sherbrooke St. W., Montreal, Que., archts. Backler & Horvath, 5253 Decarie Blvd., Montreal, Que., engrs.

▲ **Robert McAlpine Ltd.**, 310 Victoria Ave., Montreal, Que., CA **$3,500,000**, BANK and OFFICE reconstr., extension, 437 St. James St. W., MONTREAL, QUE. Bank of Nova Scotia, 44 King St. W., Toronto, Ont. Bids Sept. 30. CD 10/20, under LB.

▲ **David Caplan Constr. Ltd.**, 5174 Cote des Neiges Rd., Montreal, Que., CA Est. **$3,000,000**, 1 story, concrete, brick, stone HOUSING near main road, VAUDREUIL, QUE. Vaudreuil Housing Co., c/o contractor.

PUERTO RICO

BUILDINGS—LB & CA

▲ **Hamilton Corp.**, 800 Labra St., Santurce, Puerto Rico, Owner Builds, **$3,039,700**, 3 and 4 story APARTMENT, RIO PIEDRAS, PUERTO RICO. United Planning Services, 800 Labra St., Santurce, Puerto Rico, archts.

AMERICANS ABROAD

HEAVY CONSTRUCTION—BA

▲ **Israel, Ashdod**—PORT IMPRVS.—BA 12/30—Ministry Transport & Communications, Gov. of Israel, Tel Aviv, main and lee breakwater, 3 wharves, dredging, excav. $45,000,000. Plans deposit $100. CD 10/12/59.

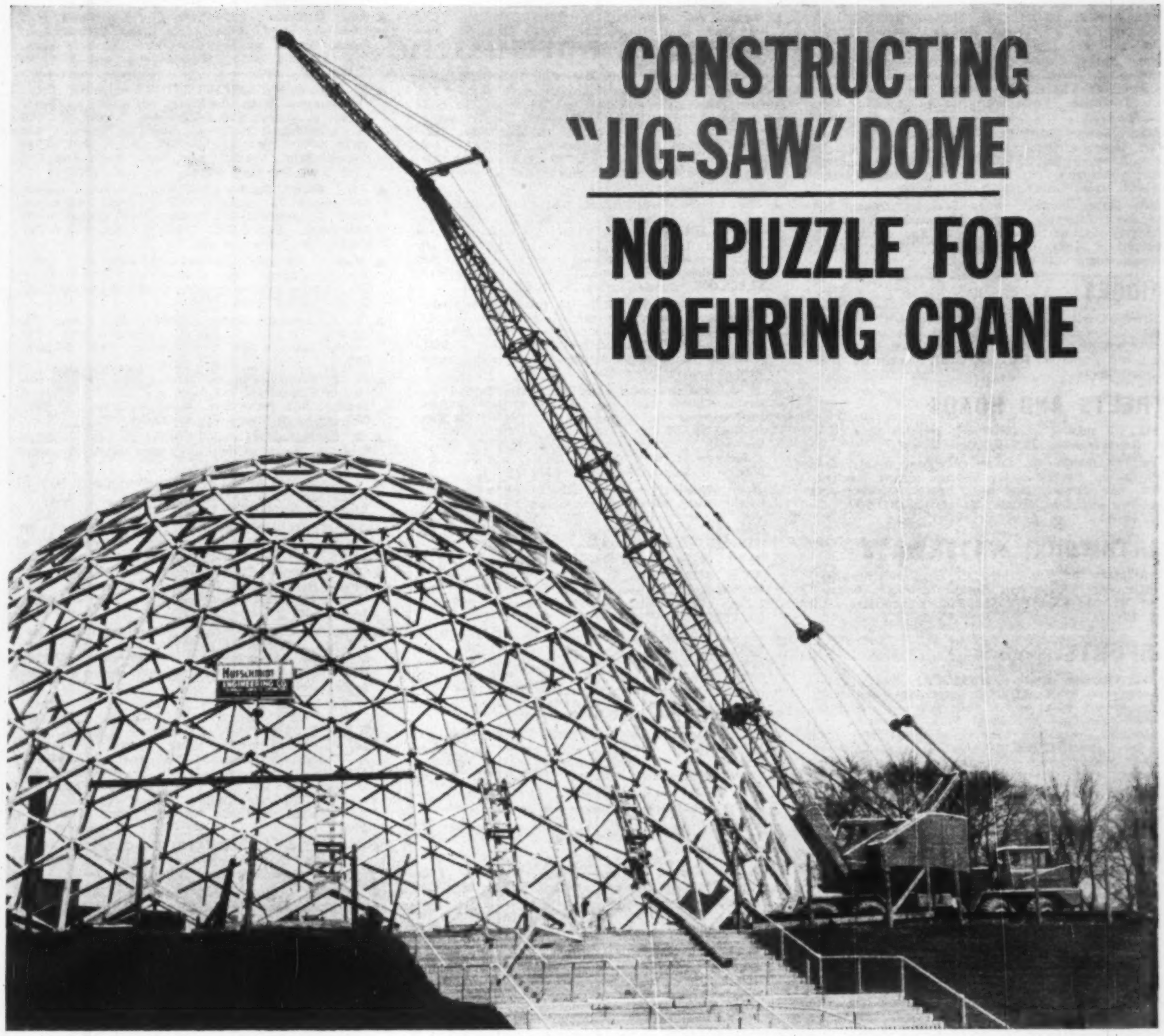
PROPOSED PROJECTS

WATER SUPPLY

▲ **N. C., Asheville**—City, City Hall, water lines from North Fork Reservoir to Bee Tree Junction and from city main line at Haw Creek to junction at Biltmore. **$4,500,000.** Charles T. Main, Inc., Wachovia Bank Bldg., Charlotte, consult. engr. CD 10/18.

SEWERS, WASTE DISPOSAL

▲ **Fla., Orlando**—City, City Hall, voted **$4,500,000**



CONSTRUCTING "JIG-SAW" DOME

NO PUZZLE FOR KOEHRING CRANE

Koehring truck crane with 85-ft. boom and 25-ft. jib handles all erecting of precast forms for unique dome.

A group of unique new landmarks is rising in Milwaukee's Mitchell Park: giant domes of concrete and glass for a modern botanical garden. Milwaukee's Hufschmidt Engineering Company has the task of casting and erecting the concrete hexagons, diamonds and triangles that form the framework for two of these eye-catching structures.

Fast accurate placing of these precast forms — some of which weigh more than 5000 pounds — calls for a crane with real *precision* control and smooth easy mobility. That's why Hufschmidt uses a Koehring 445 . . . a crane that easily meets all the requirements, speeds completion of the job.

Ask *your* Koehring distributor for all the facts about Koehring truck cranes . . . they can make money for you, too!

K 33

More Work Capacity . . .
More Profit Per Dollar Invested!

KOEHRING HEAVY DUTY

KOEHRING
DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

bonds Nov. 8, sanitary and storm sewers. Smith & Gillespie, 123 E. Forsyth St., Jacksonville, consult. engrs. CD 8/2.

▲ **Kan., Kansas City**—City, City Hall, voted $15,000,000 bonds Nov. 8, sewage treatment facilities. **$25,000,000-$30,000,000.** Truman Schlup, 1401 Fairfax Trafficway, Kansas City, Kan., consult. engr. CD 10/6.

▲ **Mass., Salem**—South Essex Sewerage Dist., 50 Fort Ave., sewerage rehabilitation, Peabody, Salem, Beverly and Danvers. **$6,000,000-$6,500,000.** Green Engineering Affiliates, Inc., 177 Milk St., Boston, Mass., consult. engr. Constr. 1961. CD 8/18.

▲ **New Jersey**—Passaic Valley Sewerage Comn., 764 20 Ave., Paterson, completing Newark Bay Sewage Pumping Station, Newark, Essex Co. **$3,500,000.** Metcalf & Eddy, 156 Stuart St., Boston, Mass., consult. engrs. CD 4/25.

BRIDGES

▲ **IOWA**—Clinton Bridge Comn., Clinton,
Clinton Co.—Lyon Fulton bridge over Mississippi River north end of city. **$5,000,000.** Modjeski & Masters, 6th and Forrester Sts., Box 167, Harrisburg, Pa., consult. engrs.

STREETS AND ROADS

▲ **Fla., Orlando**—City, City Hall, defeated bonds Nov. 8, street imprvs. **$3,570,000.** CD 8/2.

▲ **Pa., Pittsburgh**—Bd. Comrs. Allegheny County, Zone 19, 3 mi. limited access highway serving industrial dist. near airport, land being condemned, two lanes to be built now, Phase No. 2, **$2,500,000.** CD 12/15/43.

EARTHWORK, WATERWAYS

▲† **Arkansas and Missouri**—U. S. Eng., 300 Broadway, Little Rock, Ark., Bull Shoals Reservoir (Units 7 and 8). **$7,900,000.** $100,000 appropriated. CD 11/13/51.

AIRPORTS

▲ **Fla., Daytona Beach**—AMUSEMENT PARK, etc.—Owner, c/o W. R. Gomon & Assocs., archts., Municipal Airport Bldg. No. 1, P.O. Box 1671, Florida's Land of Fantasy Amusement Park, 116 acres, incl. submarine, miniature town, restaurants, etc. north of here. Over **$10,000,000.** Carl Gerken, 431 Jabaly Ave., assoc. archt. Kenneth Cooper, c/o archt., consult. engr.

▲ **N. Y., Flushing**—EXHIBIT BLDG.—American Gas Assn. & Gas Appliance Manufacturers Assn., 420 Lexington Ave., New York, Zone 17, plans by Walter Dorwin Teague, 415 Madison Ave., New York, Zone 17, exhibit bldg. at World's Fair. **$5,500-000.**

▲ **Tenn., Memphis**—STADIUM—Memphis Stadium Committee, Inc., c/o James Moore, city comr., Memphis, stadium to seat 60,000 persons, with expansion possible to 100,000 seats. **$2,000,000.** CD 12/16/48.

PUBLIC BUILDINGS

▲ **Caif., Los Angeles**—POWER PLANT—City of Los Angeles, City Hall, and City of Pasadena, City Hall, 50,000 kw. protype nuclear power plant with boiling water reactor, Haskell Canyon, Los Angeles Co. Negotiations between Cities and Atomic Energy Comm. underway. Project needs Congressional approval. Allis-Chalmers Mfg. Co., Wash., D. C. has offered to design and construct the project at **$10,760,370.** Completion is planned for 1964. The project is protype for 300,000 kw. reactor.

▲ **Del., Wilmington**—SCHOOL—Alfred I DuPont School Dist., 1400 Foulk Rd., plans by Whiteside, Moeckel & Carbonell, 9th and Market Sts., elementary school, March and Silverside Rds., **$2,250,000.** CD 8/29/57.

▲ **Fla., St. Petersburg**—HOSPITAL—City, City Hall, plans by Bruce & Parrish, 2710 9th St. N., St. Petersburg, Mercy Hospital (City Hospital), **$2,000,000.** CD 3/15.

▲ **Hawaii, Honolulu**—EAST-WEST CENTER, etc.—University of Hawaii, Wilder Ave., Honolulu, plans by Clifford Young and I. M. Pei, 931 University Ave., Ext. Rm. 207, Honolulu, Hawaii, First Phase, East-West Center, **$6,300,000,** CD 10/28; plans by Lublin, McGaughy & Assocs., 2964 East Manoa Rd., Honolulu, Hawaii, Institute of Geophysics. **$3,000,000,** CD 7/6; plans by Kenji Onodera, 1145 Bishop St., Honolulu, Hawaii, 10 story Gateway House Student Dormintory, **$1,300,000;** plans by Takashi Anbe, 1631 Kapiolani Blvd., Honolulu, Hawaii, health institute, University of Hawaii, **$1,300,000.** CD 8/6/59.

▲ **Ill., Peoria**—SCHOOLS—Bd. Educ., 3202 Wisconsin St., voted bonds Nov. 8, 1,100 seat auditorium, 3,000 seat gymnasium, Manual Training High School, Russell Field, **$763,000;** Woodruff High School, **$1,153,500;** rehab. Roosevelt Junior High School, **$401,975;** Peoria High School, **$1,997,930;** Trewyn Junior High School, auditorium and cafeteria, **$3,300,280.** CD 9/22.

▲† **Md., Gaithersburg**—BUILDINGS—General Services Admin., Pub. Bldgs. Service, 19 and F Sts. N. W., Wash. 25, D. C., plans by Voorhees, Walker, Smith, Smith & Haines, 101 Park Ave New York, N Y., 20 buildings for Bureau of Standards. First Phase: laboratory site preparation, roads, utilities, power plant. **$100,000,000.** (1st Phase $23,500,000) $10,000,000 appropriated. CD 12/9/57.

▲ **Mass., Worcester**—PUBLIC LIBRARY—City, City Hall, plans by Curtin & Davis, 2475 Canal St., New Orleans, La., public library. **$2,800,000.** Constr. 1961. CD 2/20/52.

▲ **Minn., Minneapolis**—HOUSING FOR THE ELDERLY—Minneapolis Housing and Redevelopment Auth., 215 Public Health Center Bldg., four 12 story, 352 units low-rent public housing for the elderly, Sites 5 and 6, 6 St. S., 7 St. S., 16 Ave. S. and Cedar Ave., **$2,868,000;** three 4 story apartments, Site 76, 3 Ave. and University Ave. NE, Site 77, 2 St. and 7 Ave. NE and Site 78, 5 St. and Washington St. N.E. **$1,000,000.** Constr. late 1961.

▲ **Mo., Columbia**—MEMORIAL STUDYING UNION, etc.—Curators University of Missouri, 116 Jesse Hall, plans by Jamieson, Spearl, Hammond & Grolock, Arcade Bldg., St. Louis, Zone 1, 3 story, 33,000 sq. ft. south wing Memorial Studying Union; 2 story, 57,300 sq. ft. Student Union annex, Rollins St. and The Mall, **$2,605,000.** Constr. Spring 1961. CD 11/16.

▲ **N. J., Cranford**—SCHOOLS—Bd. Educ. Cranford Twp., Central Ave., referendum bonds and project Jan. 17, Junior High School, Hilliside Ave. **$2,500,000,** CD 10/13, and Senior High School, Orange Ave, **$3,000,000.** Epple & Seaman, 901 Broad St., Newark, archts. CD 5/24.

▲ **N. J., New Brunswick**—ENGINEERING—Rutgers University, College Ave., plans by Frank Grad & Sons, 11 Commerce St., Newark, N. J., engineering bldg. at site. **$5,500,000.** Sears & Kopf, 45 W. 45 St., New York 36, N. Y., consult. engrs. Farkas & Barron, 5 Beekman St., New York 38, N. Y., structural engrs. Bids in February 1961. CD 12/14/59.

▲ **N. J., Rosella Park**—HIGH SCHOOL—Bd. Educ. Boro Roselle Park, referendum bonds and project Jan. 17, high school, Webster Ave. **$2,500,000.** Emil Schmidlin, 50 Evergreen Ave., East Orange, archts. CD 9/21.

▲ **N. J., Toms River**—SCHOOLS—Bd. Educ. Twp. of Dover, 306 Horner St. plans by Micklewright & Mountford, E. Stuyvesant St., Trenton, Junior High School, **$2,300,000;** elementary school, **$548,000.** CD 12/5/58.

▲ **N. Y., Brooklyn**—INDEPENDENCE HOUSES—NEW York City Housing Auth., 299 Broadway, New York, Zone 7, plans by Holden, Egan, Wilson & Corser, 630 3 Ave., New York 17, N. Y., Proj. NYS-100, Independence Houses, 750 apartments, Clymer St., Wilson St., Wythe Ave. and Bedford Ave. **$8,915,000.** Bids late 1961. CD 3/18.

▲ **N. Y., East Meadow**—ELECTRONIC CANCER TREATMENT—County of Nassau, Old County Court House, Franklin Ave., Mineola, electronic cancer treatment bldg., Meadowbrook Hospital. **$3,264,000.** Capital Fund Project in 1961 Budget.

▲ **N. Y. Great Neck**—SCHOOL—Bd. Educ. UFSD No. 7, 345 Lakeville Rd., plans by Moore & Hutchins, 800 2 Ave., New York, Red Brook Elementary School. **$2,750,000.**

▲ **N. Y., Locust Valley**—SCHOOL, etc.—Bd. Educ. Central School Dist. No. 3, Horse Hollow Rd., plans by Eggers & Higgins, 100 East 42 St., New York, N. Y., Junior-Senior High School and natatorium. **$4,597,500.**

▲ **N. Y., Mineola**—ADMINISTRATION—County of Nassau, Old County Court House, Franklin Ave., administration bldg. add. for Board of Elections, Motor Vehicle Bureau. **$2,003,000.**

▲ **N. Y., New Rochelle**—HOUSING—New Rochelle Housing Auth., 750 5 Ave., plans by Horace Ginsbern & Assocs., 205 E. 42 St., New York, Zone 17, 150 units public housing, Main St. between Harrison and Echo Aves. **$2,805,000.** Constr. Spring 1961. CD 4/8.

▲ **N. Y., New York**—CROTONA PARK HOUSES—New York City Housing Auth., 299 Broadway, New York 7, plans by Lapidus, Kornblath, 139 E. 56 St., New York 22, N. Y., Crotona Park Houses: Proj. NYS-108, 280 apartments, Crotona Ave., Crotona Park north and Cross Bronx Expressway, Bronx Boro. **$3,695,800.** Bids about March-April 1961. CD 3/18.

▲ **N. Y., Roosevelt**—SCHOOLS—Bd. Educ., UFSD No 8, Wagner Ave. SENIOR HIGH SCHOOL, and primary school. **$2,000,000-$3,000,000.**

▲ **O., Lorain**—HOSPITAL—City, City Hall, voted **$3,500,000** bonds Nov. 8, Lorain Hospital. Ross Garrett & Assocs., 324 N. Lake Shore Dr., Chicago, Ill., archts.

▲ **Okla., Tulsa**—LIBRARY—City, City Hall, and Tulsa Co., Courthouse, bond election Dec. 13, city-county library. **$3,850,000.** W. R. Wooten, City hall, owner's engr.

▲† **S. C., Charleston**—HOUSING—Dist. P. Wks. Office, 6th Naval Dist., plans by Thomas F. Faires & Associates, Inc., archt. consult. engr., 1027 Falls Bldg., Memphis 3, Tenn., 500 units, Capehart Housing, **$8,250,000.** CD 11/18.

▲ **Va., Richmond**—OFFICE—State Hy. Dpt., 1221 E. Broad St., Richmond, plans by Carneal & Johnson, 602 W. Cary St., 10 story office. **$5,000,000.** CD 8/29.

COMMERCIAL BUILDINGS

▲ **Calif., Los Angeles**—OFFICE—Los Angeles Federal Savings Assoc., 875 N. Vine St., plans by Honnold & Rex, 9026 Melrose Ave., 16 story office, Sunset and Vine Sts. **$2,000,000.** Bids March 1961.

▲ **Fla., Bradenton**—SHOPPING CENTER—Owner, c/o Alfred T. Floyd, archt., 433 Grand Central Ave., Tampa, 55,000 sq. ft., steel frame, concrete block, brick shopping center, Manatee Ave. and 51st W. **$2,000,000.**

▲ **Fla., Kendall**—SHOPPING CENTER—Myerhoff Corp., First National Bank, Baltimore, Md., plans by Weed-Johnson & Assocs., 550 Brickell Ave., Miami, 800,000 sq. ft. Dadeland Shopping Center, U. S. Hy. 1 and North Kendall Dr. **$10,000,000.** H. J. Ross, 1735 Biscayne Blvd., Miami, struct. engr. Weeks Eng. Co., 1735 S.W. 3rd Ave., Miami, Fla., elec. engr.

▲ **Fla., Miami Beach**—APARTMENTS—Milton Lipkin, 940 Lincoln Rd., plans by Morris Lapidus, Kornblath, Harle & Liebman, 940 Lincoln Rd., Crystal House Apartments. **$3,500,000.** Oboler & Clark, 927 Arthur Godfrey Dr., struct. engrs.

▲ **Mass., Springfield**—APARTMENT—Wolper Enterprises, Inc., c/o Max Girberg, archt., 293 Bridge St., 13 story apartment, 300 car parking. **$2,500,000.** Constr. Spring 1961.

▲ **N. J., Laurence Harbor**—HOMES—Saul Cantor Associates, Inc., U. S. Hy. 9, Laurence Harbor, 290 homes, Sayre Woods area, Madison Twp. **$4,500,000.**

▲ **N. J., Newark**—COLLEGE BUILDINGS—Newark College of Engineering, 32 High St., plans by Epple & Seaman, 901 Broad St., college buildings. **$7,000,000.** Bids in 1962. CD 11/23/59.

▲ **N. J., Secaucus**—Motel—Cherry Hill Inn, Haddonfield Rd., Merchantville, 1,200 room motel, off Garden State Parkway. **$3,000,000.**

▲ **O., Columbus**—APARTMENT—Tocomo Corp., 965 E. Broad St., 12 story, 185 unit apartment, 1100 E. Broad St. **$3,000,000.**

▲ **Pa., Phila.**—HOSPITAL—Pennsylvania Hospital, 8th and Spruce Sts., plans by Martin, Stewart & Noble, 117 S. 17th St., hospital. **$3,000,000.** CD 8/10/59.

▲ **Tex., Dallas**—HOTEL—Marriott Motor Hotel, subsidiary Hot Shoppes, Inc., Dallas Love Field, Marriott Motor Hotel, Stemmons Freeway and Industrial. **$4,500,000.**

▲ **Tex., McQueeney** — HOMES — Treasure Island, Inc., c/o 123 Greenhaven St., San Antonio, plans by Geo. MacKenney, 123 Greenhaven St., 100 homes. **$2,250,000.** R. Marvin Shipman, 202 W. Olmos Dr., San Antonio, consult. engr. Contract soon.

▲ **Tex., San Antonio**—OFFICE, etc.—Morris Kallison, 124 S. Flores St., plans by Atlee B. & Rob. M. Ayres, 342 W. Woodlawn Ave., 7 story, 125,000 sq. ft., concrete frame office, Cypress St. between N. McCullough Ave. and Main Ave., **$2,500,000;** 400 car parking garage, Cypress St. between N. McCullough Ave. and Main St., **$250,000.** Reynolds & Morgan, 1003 Ins. Bldg., and Martin E. Staley, No. 31 Chandler Bldg., consult. engrs. Bids early 1961.

▲ **Tex., San Antonio**—APARTMENT—Owner, c/o Leland S. Austin, chn. Nat'l Bank Commerce, San Antonio, Elderly People Apartment. **$7,000,000.**

▲ **Va., Virginia Beach**—HOSPITAL and NURSING HOME—Princess Anne Medical Center, Inc., will not construct hospital and nursing home, Virginia Beach Blvd. **$2,000,000,** Project abandoned. Shriver & Holland, Flat Iron Bldg., Norfolk, Va., archt. Isadore & Zachary Rosenfield, 45 W. 45th St., New York, N. Y., consult. archts. CD 4/12.

▲ **Wis., Cudahy**—APARTMENT—Towne Realty Co., 5225 W. Burleigh St., Milwaukee, plans by Tannenbaum & Koehnen, 2465 W. Capitol Dr., Milwaukee, 10 story, 230 unit apartment. **$3,000,000.** CD 5/18.

PUBLIC BUILDINGS

▲ **N. J., Perth Amboy**—INDUSTRIAL PARK—Middlesex-Amboy Industrial Parks, 5 Spring St., New Brunswick, plans by Erwin Gerber, 11 Commerce St., Newark, Golden Circle Industrial Park, incl. light manufacturing bldgs., employees recreational facilities, Pennsylvania R.R. spur, Hy. 35, Madison Twp., near here. **$30,000.000** (5-6 year program). **$3,000,000** to go ahead first year. H. Thomas Carr, 313 State St., Perth Amboy, engr. Reo Contracting Co. has been set up by owner to handle project.

▲ **O., Brecksville**—RESEARCH CENTER—B. F. Goodrich Co., 500 S. Main St., Akron, research center addn., **$1,500,000;** Phase 2, research center addn., **$2,500,000.**

▲ **O., Cincinnati**—PARKING GARAGES—Expressway Parking Co., c/o Vogt, Ivers, Seaman & Assocs., archts., 34 W. 6th St., two 5 story parking garages, between Race, Vine and Main and Walnut Sts. **$6,600,000.** CD 10/21.

▲ **O., Middletown**—PLANTS—Armco Steel Corp., Middletown, four 207,000 sq. ft. plants for spiral welded pipe operations. **$2,500,000.** CD 6/17/59.

▲ **Tex., Houston**—PLANT—Columbia-Southern Chemical Corps., Bank of Commerce Bld., plant addn., Lawrence Dr. **$3,500,000.** Walter Kidde Engineers Southwest, Inc., 1205 Holman St., consult. engr. Constr. early 1961.

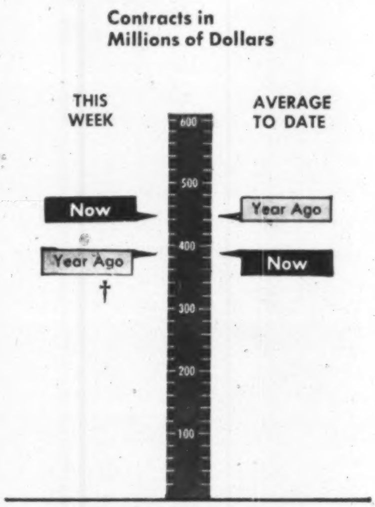
PUERTO RICO

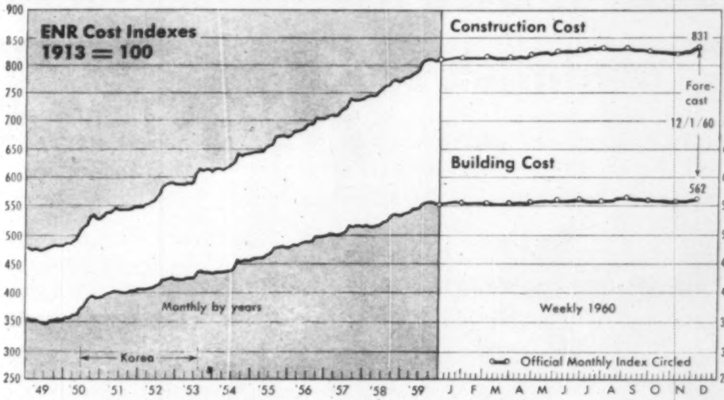
▲ **Puerto Rico** —Rio Piedras—HOUSING—Puerto Rico Urban Renewal & Housing Admin., Box 397, Rio Piedras, plans by Schimmelpfenning, Ruiz & Gonzalez, Edificio Montserrate Munoz Rivera St., Rio Piedras, Puerto Rico, 400 rein.-con. public housing **$3,000,000;** three 456 units low housing, **$3,500,000.**

(Proposal Advertisements see pp. 88 to 90)

Construction Scoreboard

This Week . . .





ENR INDEXES (1913 = 100), 20-cities' average	Week of Dec. 1 1960	% Change from Nov. 3 1960	% Change from Dec. 3 1959
Construction Cost	830.16	+0.06	+2.7
Building Cost	561.50	+0.07	+1.6

*Official Monthly Index for December, 1960.

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.030; Building Cost by 1.350.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

AMOUNT OF CONTRACTS LET

Contracts Awarded In 50 States By Type	This Week millions	Cum. 49 wks 1960 millions	Chge '59-'60 %
All Heavy Construction	$446.1	$21.859.7	+14
By Ownership			
PRIVATE	192.2	11,682.9	+19
PUBLIC	253.9	10,176.8	+ 8
State & Municipal	181.3	7,903.5	+17
Federal	72.6	2,273	−15
By Type of Work			
PUBLIC			
Waterworks	9.9	438.8	+21
Sewerage	10.7	572.1	− 7
Bridges*	10.1	760.3	+41
Highways	62.6	3,241.1	+18
Earthwork, Dams & Waterways	14.4	719.6	−16
Buildings:			
Excl. Housing	93.6	2,416.2	− 1
Housing	9.9	675.8	+17
Unclassified	42.7	1,361.6	+ 5
PRIVATE			
Buildings:			
Mass Housing	110.4	5,604.1	+27
Commercial	44.5	2,442.8	+21
Industrial	33.4	2,649.1	− 8
Unclassified	3.9	978.2	+107

* Includes Private bridges † 4-day week

NOTE Minimum size projects included are: Waterworks and waterways, $53.000; other public works, $88.000; industrial buildings, $110.000; other buildings, $400.000.

NEW CONSTRUCTION CAPITAL

	Week of Dec. 1 millions	Cum. 48 wks millions	Chge '59-'60 %
Corporate Securities	$ 10.0	$3,466.3	−12
State and Municipal:			
All Except Housing	42.5	5,915.5	+ 8
Housing	14.9	213.9	+99
Federal Loans	....	173.9	+30
Federal Aid	....	3,228.4	− 3
Total Nonfederal	$ 67.3	$12,998.0	+0.2
Federal Appropriations:			
Projects in U. S.	....	$3,165.6	−11
Outside U. S.	....	159.1	+610
Total New Capital	$ 67.3	$16,322.7	− 1

This Month . . .

WAGE RATES, 20-cities' average	Dec. 1960	% Change from Nov. 1960	% Change from Dec. 1959
Common	$2,747	+0.07	+4.6
Skilled (average 3 trades)	4,099	+0.1	+4.0
Bricklayers	4,312	+0.05	+3.4
Carpenters	3,839	+0.2	+4.4
Structural Ironworkers	4,145	0	+4.2
Equipment operators (average three types)	3,728	+0.03	+4.7

MATERIAL PRICES, 20-cities average	Dec. 1960	% Change from Nov. 1960	% Change from Dec. 1959
Structural Steel (average 3 mills), per cwt	5.50	0	0
Lumber, 2x4 Fir, per M fbm	115.51	−0.3	−4.2
Lumber, 2x4 Pine, per M fbm	108.73	+0.3	+0.6
Cement, bulk, per bbl	4.03	+0.2	+2.3
Sand, per ton	2.362	0	−4.3
Ready-mixed concrete, per cu yd	14.27	−0.5	+1.0
Gypsum sheathing, ½"x2'x8', per Msf*	62.47	0	−1.6
Fiber board sheathing, ½" sq. ed., per Msf*	70.66	0	−3.9
Mineral wool insulation, 3' batts, per Msf*	68.12	0	−0.4
Crushed stone, 1½", per ton, CL.	2.648	0	−1.7
Concrete blocks, sand/gravel, 8"x8"x16", each*	0.2284	0	−8.5

Latest Month . . .

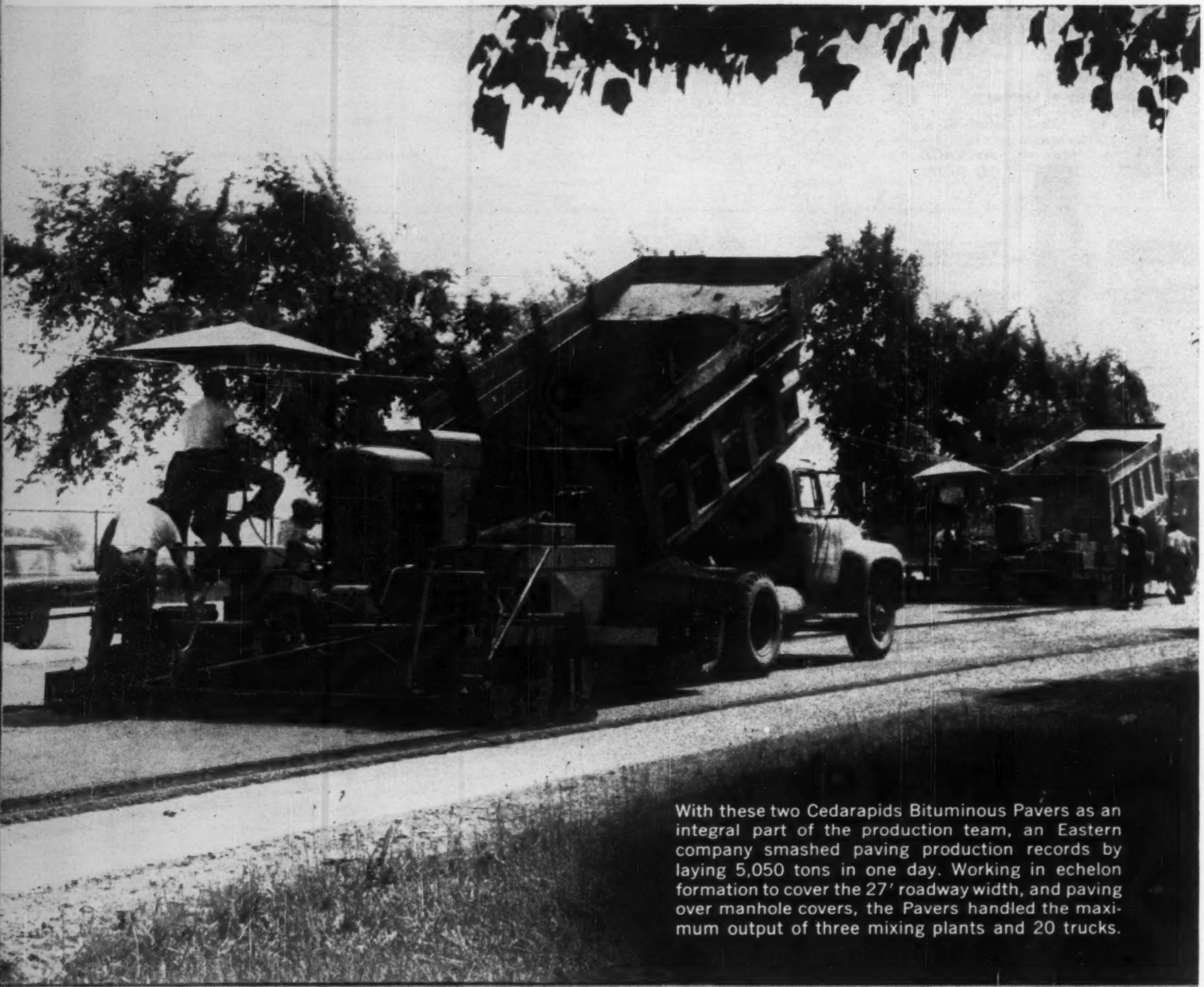
	Nov. 1960	Oct. 1960	Nov. 1959
Brick, common per M	40.94	−0.2	+3.4
Lime, hydrated finishing, per ton, CL.	43.20	+1.6	+0.5
Structural clay tile, 3x12x12", per M, 2,000 up*.	188.91	+0.4	+2.2
Vitrified clay sewer pipe, std 12", per ft	1.403	−0.4	+2.6
Concrete sewer pipe, 12", per ft	1.419	0	+4.8

*Delivered, trucklots

ENR INDEX REVIEW

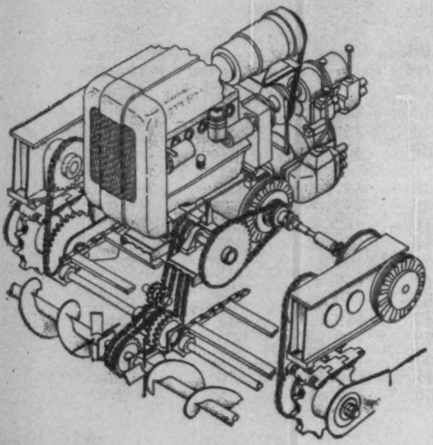
	Construction Cost		Building Cost		Volume	
1959	1913=100	1949=100	1913=100	1949=100	1913=100	1949=100
Oct.	810.60	169.93	555.40	157.88	415	120
Nov	808.98	169.59	554.19	157.53	509	147
Dec.	807.85	169.35	552.30	157.10	436	126
1959 Average	**796.91**	**167.06**	**547.82**	**155.72**	**540**	**156**
1960						
Jan.	811.84	170.19	554.40	157.59	432	125
Feb.	812.73	170.37	555.43	157.89	486	140
Mar.	813.26	170.48	555.16	157.81	533	154
Apr.	814.78	170.80	555.98	158.04	695	201
May.	822.58	172.44	559.57	159.06	610	176
June.	826.64	173.29	561.02	159.48	784	227
July.	829.33	173.85	562.63	159.93	682	197
Aug.	830.18	174.03	562.17	159.80	631	182
Sept.	830.92	174.19	562.79	159.98	603	174
Oct.	829.58	173.90	561.45	159.60	591	171
Nov	830.09	174.01	561.11	159.50	609	176
Dec.	830.61	174.12	561.50	159.61	...	...

Bid tight paving schedules with confidence ——



With these two Cedarapids Bituminous Pavers as an integral part of the production team, an Eastern company smashed paving production records by laying 5,050 tons in one day. Working in echelon formation to cover the 27′ roadway width, and paving over manhole covers, the Pavers handled the maximum output of three mixing plants and 20 trucks.

Cedarapids Engineered for lowest cost per ton



This is a typical illustration of the simplicity of Cedarapids Paver design which reduces maintenance costs. Note that only 6 chains and 2 V-belts are used on the Cedarapids Paver to reduce the number of wearing parts and mechanical drive linkages required. Other leading pavers have from 12 to 17 chains and from 5 to 10 V-belts to maintain. Other Cedarapids cost-cutting features include: a simple, trouble-free electrical system for all-automatic controls; easy accessibility of all parts; fewer parts for crawler track assembly and self-cleaning features reduce crawler maintenance; powerful magnetic clutches permit instant contact of clutch plates to reduce costly wear; rugged frame construction withstands impact of dumping heavy loads and the stresses of carrying the loads over uneven ground. Ask about the many other features that help reduce downtime.

CEDARAPIDS Bituminous Pavers

Give you more GO time—less downtime

The shorter your paving season, the more important *go* time is. Your profit lies in equipment that *works* all day, every day, with the absolute minimum of downtime.

That's what you get with a Cedarapids Bituminous Paver on the job—steady day-after-day work that reels off the miles of perfect mat, lets you bid low on the tightest schedules with confidence in your ability to get the job done on time and at a nice profit. Owners from all over the country give the same reports:—"Minimum maintenance with the Cedarapids Paver." "No downtime during the working season." "We finished the job ahead of schedule."

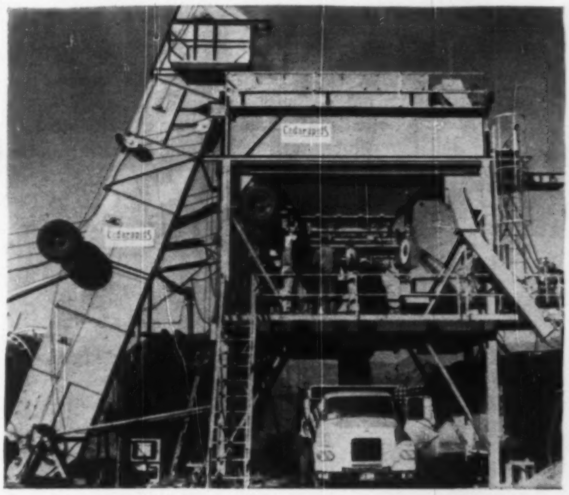
And you get more than low-cost-per-mile paving. You get fast, schedule-trimming speed. The vibrating screed "irons" the mix into a smooth, uniform, high density mat with no voids or tears even at 102 fpm operation. According to all reports, this machine is an operator's dream . . . it's so automatic it almost operates itself.

There are dozens of other profit-benefits engineered into the Cedarapids Bituminous Paver. Be sure to investigate each one and compare with other pavers. Your Cedarapids Dealer will gladly give you all the facts. See him today.

Complete your Paving Package with CEDARAPIDS

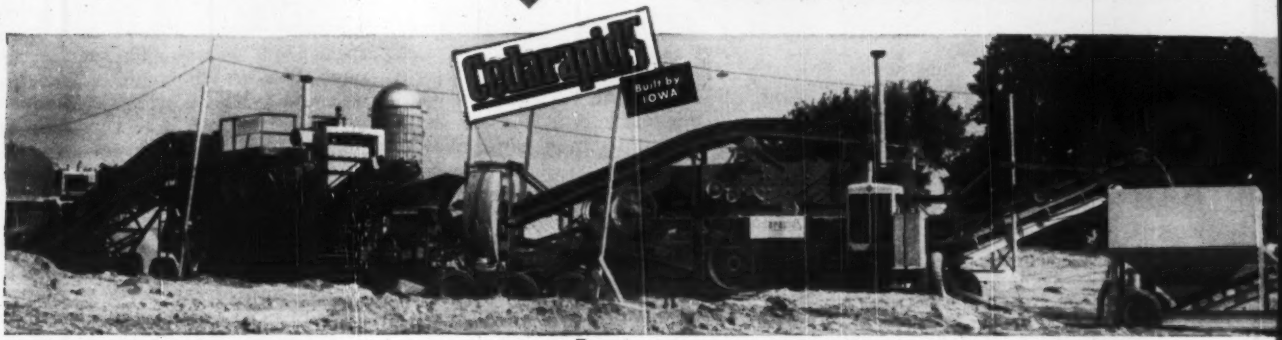
Bituminous Mixing Plants

Here's the way to supply your Paver with mix produced at lowest cost per ton. Use the Cedarapids Bituminous Mixing Plant model best suited to your production needs. The complete Cedarapids line includes all-automatic, 100% portable batch type models in sizes up to 7500-lbs; automatic, semi-automatic and manual stack-up models for either stationary or portable installation, in sizes ranging from 1500-lb. to 7500-lb. batches; also available are two sizes of continuous mix plants.



Portable Aggregate Plants

Low-cost aggregate cuts cost per ton on your entire paving project. With the complete line of Cedarapids Portable Aggregate Plants, you can produce aggregate in any quantity to practically every specification. The Cedarapids line includes a profitable variety of different units, ranging from portable primary crushers, intermediate crushing and screening plants, secondary crushing and screening plants, tandem crusher aggregate plants, conveyors, bins, and other production boosting auxiliary equipment.



IOWA
MANUFACTURING CO.
Cedar Rapids, Iowa

IOWA MANUFACTURING COMPANY, Cedar Rapids, Iowa

Gentlemen: Please send full information about the Cedarapids Bituminous Paver.

Also send details about the equipment checked below . . .

☐ Bituminous Mixing Plants ☐ Portable Aggregate Plants

☐ Ask your representative to call

Name____________________

Company____________________

Address____________________

City____________________ State__________

Business and Finance

Cities Are Confident of Federal-Aid

- **American Municipal Association expects a more sympathetic hearing in Washington to its requests for federal aid.**
- **Mayors are pushing for a Cabinet-level voice for the cities through a Department of Urban Affairs.**

Close to 2,000 of the nation's top city officials, meeting in New York City last week, spoke and acted like men who had the ear of the next U. S. President and a key to the U. S. Treasury.

The occasion was the thirty-seventh annual congress of the American Municipal Association. Purpose was to establish policy for 1961 and recommend federal programs that could result in hundreds of millions of dollars in additional outlays for construction, engineering and all types of public works planning programs.

Generally, and perhaps significantly, few recommendations established specific dollar amounts; most were couched in terms of "adequate funds should be provided." Some, such as the one on urban renewal, amended the old 1960 statement by urging "adequate funds" for urban planning assistance. It had called for an appropriation of $5 million for the purpose.

Although there were 18 resolutions contained on 30 typewritten pages, the over-all operation was basically one of amending and adding to the policy statement of 1960, which then became the 1961 policy statement.

It was the 1960 statement that contained many of the dollar-amount recommendations, and which for the most part were left unchanged. These included an airport construction program calling for $100 million a year in federal grants for each of five years and an additional $75 million for discretionary use, boosting total annual authorization under the 1956 Water Pollution Control Act from $50 million to $100 million; and restoring the public housing program to its original authorization of 810,000 units.

Chief among the recommendations, and one suggested by many other groups in recent months, is representation for cities at Cabinet level—a Department of Urban Development and Housing. If such a department is created—and President-elect John F. Kennedy has supported the idea—the mayors and city managers would have the close attention of the new President.

Chances are good that the head of such a new department would be drawn from the membership of the AMA. And because the big cities were chiefly responsible for Mr. Kennedy's slim margin of victory, there is little doubt that he will be sympathetic to the requests of city officials.

This possibly explains the absence of recommendations with a price tag attached. The estimated costs instead will be presented in advisory briefings with the President.

And because of the Democratic control of Congress, Presidential requests will fare pretty well. The mantle of confidence comfortably worn by city officials at last week's meeting is therefore understandable.

The session also pointed to what undoubtedly will prove to be a controversial topic in the new Congress—highways. Financing of the Interstate will be a focal point of controversy. The federal gasoline tax, now at four cents a gallon, will be one of the major points of disagreement. Under legislation written last year, the tax was boosted by one cent, but that one-cent increase is scheduled to expire July 1 of next year. Then, one-half of the present 10% manufacturers' excise tax on cars and five-eighths of the 8% excise tax on automotive parts and accessories are scheduled to go into the Highway Trust Fund.

All signs point to a stiff fight to retain the fourth cent, and the cities will be in the forefront of that battle. But should the cities' idea be rejected, they have forged another weapon. The AMA resolved that "should the federal tax drop one cent . . . as now scheduled, each state is urged to consider increasing its gas tax one cent, or by increasing other highway revenues."

With 46 states preparing for regularly scheduled legislative sessions, municipal delegations will be out in force, plumping for legislation that would authorize a boost in taxes if the federal levy drops. The battle lines have already been drawn, and in some states the idea may be well received. Washington State's Joint Interim Legislative Committee on Highways estimates that $4 billion will be required by 1975 to provide needed roads. The committee therefore looked favorably on raising the state gas tax by one cent, should the federal tax drop as scheduled. And in Indiana, the Highway Constructors Association is formally opposed to any reduction in the federal gas tax. There are indications that this group will urge an increased tax at the state level in the event the federal tax does fall.

One of the few dollar signs added to the AMA's 1961 policy statement involves hospital-construction objectives. Although praising the Hill-Burton Act for the benefits it provides, the statement says its fails to supply funds for "modernization and renovation of facilities in urban areas." The association therefore asks that Congress amend the legislation to authorize appropriations of $150 million annually for modernization. Need for such federal help is supported by figures of the U. S. Public Health Service, which estimates the cost of needed hospital modernization would run to $3.1 billion, according to the AMA.

Water resources development and water pollution control drew major attention. The association says that if municipalities are to catch up with treatment needs by 1965, they must spend $1.9 billion. To provide for population growth would require another $1.8 billion, while replacement of obsolete plants would require $1 billion, for a community-outlay total of $4.7 billion. To this is added the cost of new industrial waste plants at a cost of $4.5 billion.

The organization asks Congress to establish a "separate water pollution control organization, provide for comprehensive control on all surface, coastal and underground waters in accordance with a program to be established, directed and enforced by the federal government with coordination at the state and municipal levels, and provide funds and authority to expand the national water quality network to include every city and industry with a significant waste disposal load."

Increase

Under water resources planning and development, the AMA urges Congress to enact legislation establishing the river basin as the basic unit for the development and administration of water resources and within that framework:

- Provide for the comprehensive development of water resources by the construction of maximum-use, multiple-purpose works.
- Provide for recognition of all purposes, wherever applicable in water resources projects, including the purposes of navigation, flood control, power, irrigation, watershed management, water supply, low-flow augmentation, pollution abatement, recreation and conservation.
- Provide for municipal, state and federal participation in financing methods and in project costs on a uniform basis, applicable alike to all projects.

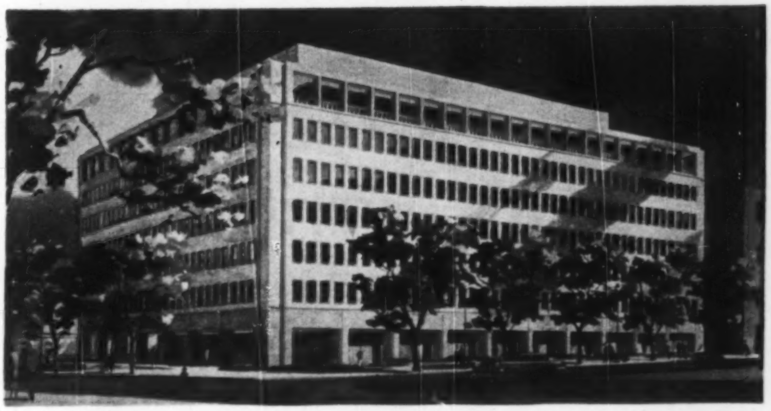
Among recommendations involving airports was one calling for legislation providing federal funds in an amount to pay for at least 50% of all needed improvements and facilities at civil airports, both in the landing area and in the terminal building area. This would include passenger terminals and supporting units attached to a passenger terminal.

Currently, federal grants can be used only for projects involving runways, taxiways, control towers and other airport components that contribute directly to take-off, flying and landing of airplanes.

AMA took a charity-begins-at-home approach in its requests for aid to depressed areas, arguing that the U.S. can't spend $2 billion to $3 billion annually abroad for economic and technical development and continue ignoring "identical needs of the most unfortunate segment of its own population."

The mayors urged technical assistance for economic analysis and planning at community and regional levels, urban renewal coverage for redevelopment of properties in depressed areas, loans for construction or rehabilitation of industrial plants, vocational training and retraining for workers in redevelopment areas, and supplementary unemployment benefits for those taking such courses.

A start in meeting the requests came this week when President-elect Kennedy appointed a special committee to draft a program for depressed-areas aid.



Bids Due on $11.5-Million Building

The U. S. General Services Administration will open bids December 15 for construction of the Washington, D. C., headquarters building of the Federal Deposit Insurance Corp. Cost of the structure is estimated at $11.5 million. Completion is scheduled for 1962. The seven-story building will contain about 264,000 sq ft of gross floor area. Exterior finish will be either granite or marble.

Architects are Chatelain, Gauger & Nolan of Washington, D. C., and Perkins & Will of Chicago.

Business in Brief . . .

- **Big federal contract**—A $32.5-million contract for construction of a 21-story federal office building in San Francisco was awarded to a joint venture consisting of Roscoe-Ajax Construction, Inc., Washington, D. C., and Knickerbocker Construction Corp., New York City. Work is expected to start next month for completion in May, 1963.

- **First of several**—First step in a $2-million civic center redevelopment program for Vernon, Calif., was taken last week with the award of a $350,000 contract to construct two buildings. One will be a warehouse and a master control room for the city's water pumping system. The other will be a maintenance shop.

- **Getting bigger**—American Pipe & Construction Co., Monterey Park, Calif., just bought all outstanding stock of Sterling Concrete Pipe Co. of Madison, Calif.

- **TV policeman** — Closed-circuit television will provide a security system protecting tenants of the new 17-story Penn Wynn House apartment building near Philadelphia. TV cameras covering all building entrances will enable the doorman stationed at the main entrance to spot unauthorized persons attempting to enter.

- **Local spending**—Houston will have to spend $28 million in the next 20 years to construct an adequate network of sanitary sewers in the northwest section of the city, according to Turner & Collie Consulting Engineers, Inc. About half of the total should be spent in the next five years because of present inadequacies, the engineers say.

- **Fund raising**—A private nonprofit corporation, Memphis Stadium Committee, Inc., is initiating a drive to raise $2 million for a 60,000-seat stadium.

- **More plans for Florida**—Thompson Homes, Inc., currently operating in the Minneapolis-St. Paul area, has started work on a housing development in the Sarasota-Brandenton area of Florida. Plans call for the construction of more than 4,000 houses.

- **Pilots defer to pavers**—A 10-day repair job on Honolulu Airport's jet runway will force six major airlines to make world-wide changes in flight schedules. A contractor working 18 hours a day will put a 2½-in. layer of asphalt on the 100-ft-wide center strip of the 12,600-ft runway next month. The airlines will use the runway the remaining six hours of each day.

6
G
HD 6
G
CHALME

WORK AWAY...
WORRY-FREE

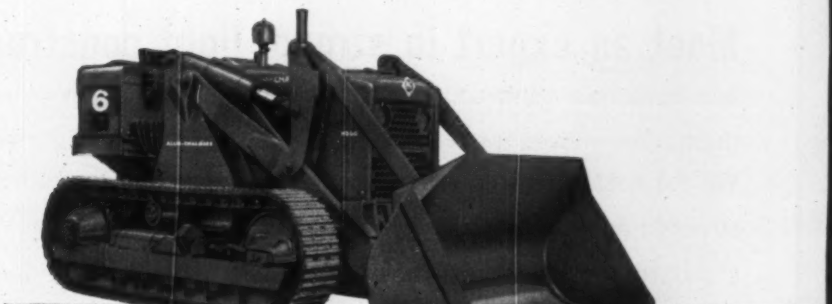
...NO ROLLER GREASING EVER!

The 72-hp Allis-Chalmers HD-6G is the only 1½-yd tractor shovel with permanently lubricated tapered roller bearing truck wheels, idlers, support rollers—gives you certified protection . . . saves greasing time, materials and money.

The PERMA-SAFE truck wheels, idlers and support rollers in the HD-6G are lubricated at the factory . . . need no further greasing regardless of conditions. PERMA-SAFE design with Positive Seals and tapered roller bearings keep lubricants in . . . dirt and moisture out . . . *for life.*

In addition to timesaving, care-free track lube, the HD-6G also features super pry-out action, highest dumping clearance, fastest reverse and many more big tractor shovel advantages.

Your Allis-Chalmers construction machinery dealer will be glad to put an HD-6G through its paces on your toughest job. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



move ahead with

ALLIS-CHALMERS

...power for a growing world

Meet an expert in strong, light construction Grass, fibers, weed stalks and horsehair don't sound much like building materials, but an oriole can do wonders with them. She weaves them into a sac-shaped nest that's light enough to suspend from thin twigs. Yet the nest is so strong that hurricane winds can't tear it from the branches. ☐ For exceptional strength and lightness in a man-made structure, we suggest USS AmBridge Steel Joists, both standard and long-span. They provide strong, lightweight and economical construction suitable for most any type of roof, ceiling or floor. AmBridge Joists have an underslung, open-web design for maximum headroom, and to accommodate pipe, ducts and conduit in all directions. AmBridge Steel Joists are easy to install. And once in place, they make a safe working platform. Want more information? Write to our Pittsburgh Office for your free copy of a 40-page catalog.

USS and AmBridge are registered trademarks

This mark tells you a product is
made of modern, dependable Steel.

General Offices: 525 William Penn Place, Pittsburgh, Pa.
Contracting Offices in: Ambridge • Atlanta • Baltimore • Birmingham • Boston
Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit • Elmira • Gary
Harrisburg, Pa. • Houston • Los Angeles • Memphis • Minneapolis • New York
Orange, Texas • Philadelphia • Pittsburgh • Portland, Ore. • Roanoke • St. Louis
San Francisco • Trenton • United States Steel Export Company, New York

American Bridge
Division of
United States Steel

Contract Awards Now Top '59 by 14%

Heavy construction contract awards totaling $1.8 billion in November set a record for the month and pushed cumulative volume for the January-November period 14% above last year to a total of more than $21 billion.

Although over-all new construction business last month was a record for a November, volume slipped 1% below October. Still it was 21% above the $1.5 billion worth of contracts awarded in November 1959.

Strength came from the public sector, with every type of public works except highways gaining on October. And compared with one year ago, only earthwork-dams-waterways failed to post an increase. As a result, public awards of $895 million rose 28% above October and 33% above the $672 million of November 1959. And for the 11-month period, public works contract awards of $9.7 billion are 7% above last year. This makes 1960 the second biggest year on record.

November's federal work—$228 million—showed 135% above the $97-million total of October and 49% ahead of the year-ago volume of $153 million. The surge resulted from contracts for federal dams, missile plants, Capehart housing, hospitals and office buildings. The 11-month total, however, is 15% short of one year ago, but the gap is narrowing. At the end of the first 10 months, federal contracts were 19% behind the first 10 months of 1959.

State and municipal construction pushes on at its near-record pace. The $667 million worth of contracts awarded in November topped October's $601 million by 11% and November 1959 volume of $519 million by 29%. For the 11 months, awards of $7.5 billion top 1959 by 16% and every full year on record except 1958.

Private construction will also wind up the year as the second best on record, falling short only of 1956 when industrial awards were booming. A sharp, largely seasonal drop in mass housing awards in November, held down the private total to $880 million, off 20% from the $1.1 billion of October. The surprising upsurge in commercial building contracts in recent months, with November volume of $280 million being almost double a year ago, is enough to offset the year-to-year declines in other private work.

Private volume in November of $790 million was 11% above a year ago. The $11.3 billion in the first 11 months represents a 21% gain over a year ago.

Mass housing continued to chalk up more volume than any other type of construction, despite its seasonal sag and an 8% drop from November a year ago. With a 29% lead over the first 11 months at 1959, mass housing will score the second biggest year on record. The 12-month total for 1960 will be topped only by 1955.

Records have already been established by waterworks, commercial building and private unclassified construction.

Both commercial and industrial building weathered normal seasonal influences in November.

Costs Up Slightly This Month

Construction and building costs enter this final month of 1960 with the smallest 12-month increase since 1949. The eased squeeze on the construction dollar is attributed to lower lumber prices and some success in shaving the size of average annual wage increases.

ENR's 20-Cities Construction Cost Index for December is 830.61, a 2.7% gain over December 1959 after a jump of 4.3% between December 1958 and December 1959. The 20-Cities Building Cost Index of 561.50 is only 1.6% above 12 months ago. It was up 3.4% in the December 1958-59 period. Both indexes are based on 1913 as 100.

During the past month, there were few factors that significantly affected costs either up or down. Increases in both indexes were less than 0.1%. Douglas fir lumber prices at the major construction centers covered by ENR continued to drift lower, despite a better market tone and higher prices at West Coast mills. Southern pine lumber prices, however, were steady to a trifle higher.

Engineering Construction Contracts for November

	November, 1960									U. S. Cumulative		%	
	New England	Middle Atlantic	South	Mid-West	Mississippi to Rockies	Far West*	Total U. S.	% Change '59 to '60	1960 (47 wks)	1959 (48 wks)	Change '59 to '60 (Av wk)	Canada Nov. 1960
Public Works, Total	58,043	192,863	126,144	140,257	161,532	215,837	894,776	+33	9,710,643	9,273,304	+ 7	54,460
Waterworks	1,513	559	4,459	4,242	7,105	20,633	38,511	+67	424,114	358,493	+21	2,824
Sewerage	1,062	18,987	12,883	14,407	8,271	4,298	59,908	+ 7	544,912	608,379	− 9	4,798
Bridges	1,828	18,847	8,279	11,595	8,296	9,550	58,404	+46	731,749	519,910	+44	5,951
Earthwork, Waterways	896	965	11,416	3,195	24,897	12,537	53,906	−20	703,297	827,269	−13	4,093
Streets and roads	9,844	74,632	26,963	46,479	70,115	38,890	266,923	+37	3,102,987	2,710,257	+17	7,678
Buildings: Residential	17,609	21,968	5,711	15,880	1,085	16,937	79,190	+191	639,579	574,017	+14	.....
Other	24,183	39,759	34,838	35,318	32,200	88,209	254,507	+36	2,269,586	2,417,769	− 4	17,282
Unclassified	1,108	17,146	21,595	9,241	9,563	24,774	83,427	+10	1,294,419	1,256,310	+ 5	11,834
State & Municipal	33,057	185,821	84,556	125,292	129,016	100,526	667,268	+29	7,548,732	6,672,837	+16	44,870
Federal	24,986	7,042	41,588	15,065	32,516	106,311	227,508	+49	2,161,911	2,600,467	−15	9,590
Private, Total	39,790	356,584	115,288	87,988	167,295	113,188	880,133	+11	11,318,002	9,548,612	+21	40,159
Bridges	......	......	2,000	1,188	......	......	3,188	+1175	8,695	11,173	−20	.....
Buildings: Industrial	4,177	88,716	28,245	34,266	66,185	34,023	255,612	− 6	2,574,621	2,774,330	− 5	6,291
Mass housing	19,494	129,213	46,401	26,080	60,460	43,076	324,704	− 8	5,432,124	4,306,687	+29	22,131
Commercial	15,126	138,155	32,830	24,380	34,999	34,797	280,287	+92	2,333,069	1,992,096	+20	11,653
Unclassified	993	500	5,812	2,094	5,651	1,292	16,342	−23	969,493	464,320	+113	84
Total, Nov., 1960—4 wks*	97,833	549,447	241,432	228,345	328,827	329,025	1,774,909	+21	....	....	....	94,619
Total, Oct., 1960—4 wks*	104,883	324,042	273,900	312,055	277,905	502,749	1,795,534	....	....	....	....	262,734
Total, Nov., 1959—4 wks*	85,950	317,687	289,881	256,589	275,849	236,277	1,462,233	....	....	....	....	95,205
Eleven Mos.,—1960 (47 wks)*	1,287,713	5,001,034	3,290,588	3,149,256	4,584,672	3,805,382	....	....	21,028,645	....	+14	1,778,633
Eleven Mos.,—1959 (48 wks)*	1,200,775	4,035,355	3,285,600	3,335,486	3,833,699	3,130,911	....	....	....	18,821,916	....	1,358,505
% Change '59 to '60 (Av wk)	+10	+27	− 1	− 4	+22	+24	....	....	....	....	....	+31

*Includes Alaska & Hawaii contracts

Union Funds to Finance Homebuilding

Fifteen unions affiliated with the Pittsburgh Building Trades Council will invest a portion of their health and welfare pension fund in home mortgages.

The total of these resources in cash, bonds, common stocks and long- and short-term federal government debt is estimated at between $30 million to $35 million.

The unions would also establish a private, nonprofit corporation to provide land purchase and development financing for builders. The corporation is expected to be capitalized initially at $750,000, which would provide a revolving fund for the land development loans. As the houses are sold, the pro-rata value of the home site would be repaid to the new corporation.

The two programs have several objectives, according to Anthony J. Furlan, president of the council. They would:

- Stimulate the housing market in the Allegheny County area by providing a source of mortgage money at interest rates below those prevailing in the region at any given time.
- Provide a source of funds for land financing for builders.
- Bring about greater use of unionized labor in homebuilding.
- Reduce the monthly cost of home ownership.
- Prove to builders that the cost of homebuilding with union labor is competitive with building with nonunionized labor.

The Pittsburgh Building Trades Council move into the home mortgage field is in line with a policy announced by the AFL-CIO Executive Council. George Meany, president, announced last summer that the federation would establish a mortgage-investment advisory center for its unions to encourage investment of funds in new mortgages at par (ENR Aug. 25, p. 80). Basic idea is to eliminate the discount frequently charged borrowers financing home purchases with government-backed mortgages. (When a mortgage—or any loan—is discounted, a borrower receives less cash than the amount he contracts to borrow, but pays interest on the contract amount and repays the contract amount. This raises the effective yield to the lender above the stipulated interest rate.)

The council now plans to provide mortgage financing at interest rates ½% to 1% below the 5.75% to 6% rates now prevailing in the area. There will be no service charge or placement fee, each of which runs to 1%. The mortgages will be serviced by a local bank at a cost of ½% or less of the mortgage volume handled.

The council will agree to accept mortgages on houses built by tract developers. Present plans call for accepting mortgages in tracts containing from 100 to 200 houses up to as many as 900 units. Mortgage-financing emphasis will be placed on houses priced in the $14,000 category.

Builders obtaining land purchase and development funds or agreements for mortgage financing from the new corporation will have to hire union workers.

It's estimated that more than 80% of Allegheny County homebuilders use nonunion labor.

Mr. Furlan says that many of the nonunion homebuilders try to cut costs by violating various building and plumbing codes.

Employment of union workers would bring enforcement of union regulations, forcing builders to abide by the local codes, according to Mr. Furlan. This in turn would result in better workmanship and materials, Mr. Furlan says.

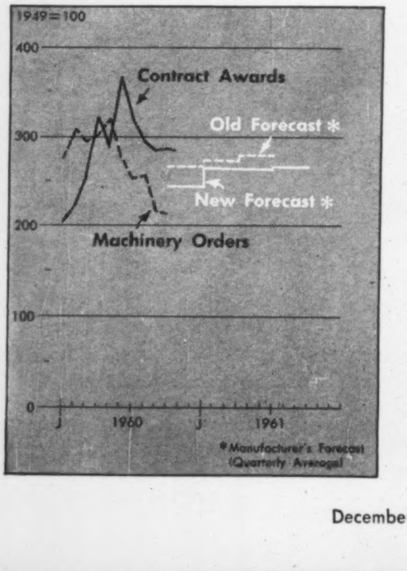
Equipment Orders Expected to Drop

Forecasts of new orders for equipment predict a fourth quarter volume slightly higher than the two-year low set by this year's third quarter. Then, in the first quarter of next year, a 7% rise is indicated, and the second and third quarters of next year are expected to hold at the pace of the first quarter.

This is the consensus of quarterly forecasts made in mid-October by manufacturers of construction and mining machinery reporting to the McGraw-Hill Economics Department. The manufacturers forecast that the fourth quarter will rise to an index value of 245, up from the third quarter average of 244. The first quarter value will rise 7% to 264, remain at 264 in the second quarter, and rise to 265 in the third quarter. The quarterly values are based on the average monthly dollar volume in 1949 as 100.

The new forecast is significantly lower than the predictions made earlier this year—in January, April and August. (See chart for August prediction and latest forecast.) For example, the forecast for the first quarter of 1961 is 3% below the August projection and 9% below the April forecast. The new forecast for next year's second quarter is 5% below the August estimate.

It's apparent that some of the equipment makers have become increasingly nervous about the outlook because their order books have filled at a slower pace than expected. This year's actual nine months' orders averaged 12% less than the forecast made in mid-January. Their forecast for January-September 1961 is that the new orders index will average 264, 5% below 1960 and 13% less than 1959's all-time high for the same period.



By contrast, ENR forecasts contractors' new heavy construction business in 1961 will be at least 3% greater than this year and will set a new record (ENR Sept. 8, p. 21). If contract awards increase any more than this, the equipment manufacturers may be too conservative in their latest forecast.

Actual business in October put volume of new orders at 142 on the index for Construction and Mining Equipment (see chart). This was about the same as September, which was revised down from 147 to 143, but 28% under one year ago. Contract awards, however, are at 286 on the index for October and at 283 in November. The contract index is based on 1949 as 100.

Here's why the NEW No. 944 Traxcavator is bringing NEW standards to wheel loader operation

CHECK THESE FEATURES

- ☐ **2 cu. yd. bucket**
- ☐ **Power shift transmission** and torque converter—provide smooth, instant finger-tip shifting. No clutching necessary.
- ☐ **Travel-work range power selection**—travel range gives 2-wheel drive for roading. Work range automatically puts power to all 4 wheels.
- ☐ **Precision, 2-pedal brakes**—left brake neutralizes the transmission as it stops the machine . . . throwing all power to hydraulic system. This gives superior loading action in tough material. Right brake leaves the transmission engaged for full control of the machine when creeping or working on slopes.
- ☐ **Safe operation**—bucket lift arms and pivot points are completely in front of operator's area. This allows freedom of movement and wide visibility. Steps offer easy access. No need to climb over tires or bucket mechanism. Fenders protect operator from mud and stones . . . provide handy platform for checking engine.
- ☐ **Extra long reach**—50¾" at 7' dumping height—for faster, more accurate loading.
- ☐ **Choice of two new engines**—whatever your job or fuel requirement there's a No. 944 powered to meet the need. Diesel engine is compact, 4-cylinder turbocharged for maximum efficiency. Or there's a 6-cylinder gas engine.
- ☐ **105 HP***—delivered from either engine. Plenty of power for machine drive and hydraulic system.
- ☐ **4 speeds forward**—0-24 MPH.
- ☐ **4 speeds in reverse**—0-30 MPH. Reverse speeds are 25% faster than forward speeds to reduce cycle time.
- ☐ **Automatic kick-out devices** on bucket control levers—the lift control releases at dumping height. Tilt control positions the bucket for digging.
- ☐ **Accessible controls**—forward-reverse lever is located on steering column. Bucket controls are at the operator's right hand. Speed range selector and work-travel lever are on the operator's left . . . within easy reach. The No. 944 has push-button starting.
- ☐ **Full line of attachments available**—including forks, cab, special buckets, and the exclusive Caterpillar Side Dump Bucket that gives added efficiency . . . speeds cycle time.

**For comparative purposes, the maximum rating of the diesel engine is 135 horsepower.*

Add 'em up. All of these features are designed to give fast, easy, safe operation. Add bold new design, sound engineering, quality construction, responsible parts and service coverage. All of these make the No. 944 Traxcavator pay off big on any wheel loader operation. See your Caterpillar Dealer. Ask for a demonstration. Compare the No. 944 with other loaders you've seen. Then you'll discover why this machine has all the bonus features and performance potential to bring new standards to wheel loader operation *on your job.*

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

A GREAT NEW PRODUCT IN THE CATERPILLAR TRADITION

Unions Study 'No Strike' Pledge on Canaveral

- **C. J. Haggerty is reviewing the system used during World War II to maintain defense construction.**
- **In return, the construction trades will want firm assurances they can hold on to their jobs if they give a no strike commitment.**
- **Meanwhile, work resumes at Cape Canaveral pending a report from a fact-finding board.**

AFL-CIO construction union leaders are seriously contemplating a no-strike pledge on missile base construction work—provided they receive assurances they can hold on to construction jobs.

This is the "quid pro quo," as one construction union official put it, behind the decision made last week by the Executive Council of the AFL-CIO Building and Construction Trades Department to review union no-strike pacts made during World War II. In that period, the craft unions worked without stoppages under a system of wage and work guarantees.

No formal pledge to halt walkouts on critical missile base projects is anticipated soon. In fact, the AFL-CIO leaders will wait until mid-February for a report on their practices during the war before they make up their minds.

In asking Building Trades President C. J. Haggerty to make the investigation, they specifically set February 15—the next meeting of the council—as the date for his report. In the meantime, the construction union officials were expected to take informal steps to cut down disputes, jurisdictional and otherwise, that have hit the missile program.

The building trades have already accomplished a great deal on the brick and mortar phase of the program, according to Army Chief of Engineers, Gen. Emerson C. Itschner. Speaking in Washington last week, General Itschner said that through the efforts of Mr. Haggerty and other union leaders, jurisdictional work stoppages have decreased 60% since last May. He attributed most of the construction delays, not to labor disputes, but to the frequency of government design changes and to late deliveries of equipment.

At the time of the two-day meeting of the building trades leaders in Washington, D. C., however, at least three jurisdictional disputes in the missile field were going on:

- At Walker Air Force Base in Roswell, N. M., a dispute between the carpenters and electricians caused a work stoppage.
- A truce between two unions, the International Brotherhood of Electrical Workers and the plumbers union, and the National Aeronautics and Space Administration put employees back on the job, temporarily at least, at Cape Canaveral (see story below).
- The plumbers and machinists were at work, under court injunction, pending settlement of their differences over representation rights at Convair Astronautics Division near San Diego, Calif.

While these three trouble-spots were part of the discussion, the craft union leaders were aiming for a broad over-all plan that could prevent all missile work disputes. However, back of the search for a peace formula was the determination that the skilled crafts would not give up their jurisdiction to either government agency "technicians" or to industrial union workers.

This craft union stand was spelled out by plumbers President Peter T. Schoemann in an editorial in the United Association journal, which was released concurrently with the meetings of craft union leaders.

Mr. Schoemann urged his union members not to "strike or picket these jobs without our approval. . . . I appeal to local unions and their members." He wrote, "Stay on that missile base job. . . ." The international union officers, he added, would fight for their job rights.

On jurisdictional disputes between the craft unions, Mr. Schoemann urged the unions to rely on the National Joint Board for the Settlement of Jurisdictional Disputes. But when it comes to disputes with non-craft unions, he indicated his union would stand firm:

"Now, who's going to do all this work? Is it going to be done by some 'technician' sent out from a plant or laboratory? Or is it going to be done by highly skilled and qualified craftsmen in the building construction industry?"

The problem, Mr. Schoemann said, is to "protect our jurisdiction but never at the expense of our country's safety."

Just how the craft union leaders can secure or hold the missile base construction work they feel entitled to has not been worked out. This is a major reason for review of wartime work practices by the craft unions.

During World War II a number of

A fact-finding board set up by Labor Secretary James P. Mitchell arrived at Cape Canaveral, Fla., last week to probe differences between the National Aeronautics and Space Administration and members of the pipefitters and electrical workers unions.

At stake is construction progress on the Saturn and Centaur complexes—two of the heavy pay-load, advanced rocket projects of NASA.

The unions struck the Saturn project November 14, when NASA placed civil service technicians on the job doing work the unions claimed was similar to that being done under contract with union labor. The work involved connections on the firing consoles.

Four days later, all the construction trades in the Saturn and Centaur areas left their jobs. They did not return until Secretary Mitchell announced an agreement had been reached November 26 to mediate the dispute.

During the strike, NASA appealed to the National Labor Relations Board in Tampa for injunctive relief. It relied in the charges it filed on the

Missile Base Work

procedures were used, including a review board for disputes and a wage adjustment board. In return for systems to settle disputes and provide wage raises, the craft unions agreed not to strike.

Part of this working arrangement between the crafts and government agencies was to secure work for the construction unions. There were no stipulations providing such jobs in the agreements. But by virtue of their work pledge and cooperation with the federal officials, the craft unions won most of their sought-after work assignments.

What's contemplated now is the same kind of understanding. If and when the craft unions give up their right to strike, they want to secure the work assignments they believe to be theirs as a return.

There is an additional concern behind the desire of building trades leaders to find a solution to missile base stoppages—apart from the obvious one of national security. They anticipate, unless these job fights end, that they may be hurt by legislative moves in Congress.

Mr. Schoemann pointed out that the craft union campaign for easing Taft-Hartley picketing curbs on construction projects may be particularly affected if the missile work is delayed. The unions also face the possibility of legislation barring missile strikes.

Such a proposal was made in Congress last year, but the craft union leaders countered with a proposal for a 10-day notice before a strike could begin. While this was criticized in some quarters as too little and too late, many craft union leaders feel this is one effective answer—it would give the international union officials time to straighten out the job disputes between themselves.

Basically, this is what they still hope to achieve—a voluntary working arrangement without the addition of new settlement systems, such as a jurisdictional appeals board. No decision has been reached on that matter, however.

The pressure on the craft union leaders for a settlement procedure will continue. At the invitation of the Air Force, AFL-CIO leaders including President George Meany, are to tour missile bases next month to take a look at the labor situation.

Back in Business—For Now

law's boycott, not the jurisdictional, section because NASA is not technically an employer. The Tampa office asked the Washington office of the NLRB for instructions and permission to file a complaint. This was refused, but the intervening high-level discussions ended in the appointment of the Mitchell board.

The board is to recommend a settlement that will not be binding as a precedent. Members are: Harold Nystrom, acting solicitor of the Labor Department; Samuel Silver, Defense Department labor relations advisor; Clarence Barker, Air Force labor consultant; Harry Gorman, NASA representative; Frank Graham, electrical workers international union; and William Todd, United Association (plumbers union) official.

A key issue is whether the government is getting further into construction work and building up an in-house capacity to do so, to the disadvantage of private contractors and building tradesmen.

NASA contends it normally does the work from where the unions stop to the missiles—a phase of work it calls "interface". This was the procedure used, it reports, on the Redstone and Jupiter projects, where the work was done by Werner Von Braun's Huntsville, Ala., team of scientists, now part of NASA.

NASA claims that the interface work calls for specialized skills and scientist-technician cooperation. It says the work has never been defined or documented, that specifications have never been written and that the work cannot be contracted.

The amount of such work, NASA contends, is very "small" but the unions think it amounts to at least 10% of the total work and that it will grow in volume. Another Saturn pad will be build next year, making the unions even more anxious to fight the "government encroachment" at Canaveral.

One union official cited unemployment in the Huntsville area as a factor attracting union members in the construction trades into civil service and thus, in effect, building up NASA's in-house capability to handle its own construction work.

Situs Bill Pushed

That's labor's first goal in 10-point program

A 10-point legislative program headed by the situs picketing bill will be pushed in the 87th Congress by the AFL-CIO building trades unions.

The program will be formally launched the week of March 20, when the AFL-CIO Building and Construction Trades Department convenes its Seventh Annual Legislative Conference in Washington, D. C.

Contents of the program, as revealed last week by the department's executive council, embrace nothing new or startling. The unions will continue to press, without a deadline, as in the past, for repeal of Taft-Hartley Section 14(b), which authorizes states to pass right-to-work laws, and for amendments to the Landrum-Griffin labor law.

Included on the department's 10-point list of immediate objectives are:

- Passage of the situs picketing bill, which would exempt certain specified types of strikes at common construction sites from the present secondary boycott ban.
- Modernization of the Davis-Bacon structure, which establishes minimum (prevailing) wages for direct and some indirect federal construction work.
- Increase in the minimum wage to $1.25 an hour, plus extended coverage.
- Legislation to increase airport and road construction, urban renewal, slum clearance, housing and community improvement.
- Federal aid to education; including school construction.
- Aid to distressed areas.
- Medical care for the aged, using the Social Security approach.

Indiana Court Sentences Two Carpenter Officials

Two officials of the carpenters union were sentenced last week to two to 14 years in prison. They were convicted earlier on charges of conspiracy and bribery relating to highway right-of-way acquisitions in Indiana. Union funds were not involved.

The officers are Maurice Hutcheson, general president, and O. William Blaier, vice president. Both men have been released on bail pending appeal of the conviction.

The union's Executive Board and the AFL-CIO Building and Construction Trades Department have, meanwhile, given Mr. Hutcheson a vote of confidence.

Steel's Labor Problems Still Unsolved

The first installment of the basic wage increase won by the steelworkers last January went into effect last week. It ranged from 7 to 13 cents an hour and averaged 9.4 cents.

The increase brought the steel industry no closer to a freer hand in effecting production economies that might offset at least part of the cost of the increase—because no solution has yet been found to the work rules problem that was a major issue in the 116-day strike last year.

R. Conrad Cooper, executive vice president of U. S. Steel Corp., and David McDonald, president of the steelworkers union, announced that the work rules study committee set up under the labor contract failed to respond to the contract demand for a "report and recommendations" for work rule changes by November 30.

The committee, they said, will continue to function "despite its contractual termination." The co-chairmen expressed the hope that the committee would have some "results" to report prior to the expiration of the industry's basic contracts in June 1962.

Steel producers bound by the contracts have contended that existing work rules hinder their efforts to achieve plant efficiency. The union has denied this, and claims the rules merely protect the legitimate rights and interests of its members. The rules committee is supposed to study the issue and to recommend "mutually" agreeable solutions.

The committee's current failure, however, cannot be construed as an indictment of the general proposition that labor and management can make more headway on knotty problems outside of contract negotiations than they can in the charged atmosphere of the bargaining table. Two other committees in the industry, for example, are still quietly at work.

One is the Human Relations Research Committee, set up without a deadline under the basic steel agreements. The other is the Long-Range Committee established under the steelworkers' contract with Kaiser Steel Corp. Both committees are operating at committee and subcommittee levels and both are searching for ways to promote long-term, labor-management peace. The Kaiser committee is purposely avoiding publicity lest it defeat its purpose of getting away from the limelight that attends contract negotiations.

One of the reasons for the failure of the work rules committee to reach a terminal point is that it has attempted the laborious task of analyzing the arbitration decisions that have been handed down under the present contract provisions on work rule changes. Those provisions give workers the right to arbitrate work rule changes that management is entitled to make, at least on the face of the contracts.

The arbitration results thus become an essential factor in determining how much of an impact the current provisions have on management's right to manage, including the right to minimize production costs.

Net result is that the committee's work is still "exploratory." The committee has not even developed a sufficient sense of direction to agree on the selection of a neutral chairman.

The terminal date of the work rules committee was set for November 30 in apparent hope that the cost of the December 1 wage increase might be partly offset by mutually agreed upon work rule changes conducive to more economical production. Not only has that now failed, but the timing also finds the industry operating at less than 50% of capacity, forestalling any talk about across-the-board price increases.

The union, too, finds the increase coming at a bad time.

A union spokesman reported last week that 150,000 steelworkers were then unemployed, with another 300,000 working a short workweek. Heavy layoffs have meant a severe drain on supplementary unemployment benefit reserves and a critical drop in contributions to the SUB funds.

As a result of this only about half of the union's members are getting much out of last week's wage increase, while many of the balance will see their jobless pay dwindle as the various SUB funds make downward adjustments in their benefits to cope with shrinking reserves.

Labor in Brief . . .

- **Not entitled to benefits**—In a case involving a union plumber, the Idaho State Supreme Court has ruled that an unemployed worker who turns down "suitable employment" because of union rules cannot draw unemployment insurance. The plumber had declined a job because it carried a salary plus commissions, not union hourly wages of $3.50.

- **Safety meeting**—Rock and tunnel workers have returned to work on the South Fork Water and Power Project, Butte County, Calif., where a tunnel explosion killed one man last month. Union is negotiating with contractors on safety and has elected safety advisers for each shift. Following another explosion at Robbs Peak, state safety officials are calling a special safety meeting.

- **Charged with violence**—An official of Cone Brothers Contracting Co., one of the firms involved in the Florida highway scandals (ENR Dec. 1, p. 35), has been charged by the National Labor Relations Board of interfering with the right of Cone workers to organize, and of resorting to assault and battery. Other Cone employees have been charged with inciting violence.

- **Equal rights**—A permanent committee on apprenticeship opportunities for minority groups has been set up under the auspices of the California conference on apprenticeship. Committee represents labor, management and minority groups, and the California Apprenticeship Council. Head of the State Division of Fair Employment Practices is a consultant.

- **"No" to joint talks**—General Motors, Ford, Chrysler and American Motors have rejected Walter Reuther's proposed, permanent, auto industry joint labor-management conference for promoting labor peace. Most objected to discussing matters outside the scope of collective bargaining. American Motors said it looked like industry-wide or pattern bargaining, which it wants to avoid.

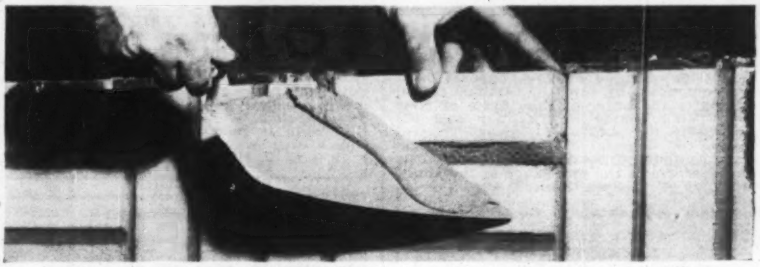
- **Prevailing wages**—The Assistant Comptroller General of the United States has ruled, in an opinion addressed to the U. S. Secretary of Labor, that the penalty provisions of the Davis-Bacon Act do not apply to construction work under the Federal Highway Act because the law failed to incorporate them. Blacklisting, he said, cannot be used.

ALPHA

BETTER CONSTRUCTION THROUGH BETTER USE OF CEMENTS

news and notes from the field

The Facts Behind Weather-Proofed Masonry Construction



STRONG, DURABLE CONSTRUCTION. Attractive, weather-resistant joints like this resist the effect of freezing and thawing, eliminate the need for costly repointing.

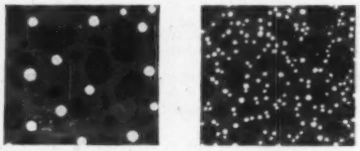
Test after test has shown conclusively that good design, good workmanship and good materials will produce sound, attractive masonry, capable of resisting the most severe conditions.

The Vital Component—Mortar

The weather resistance of a mortar used for masonry work is a measure of the mortar's efficiency in helping to produce durable construction. When joints spall and flake, they may be disintegrating because of freezing and thawing, and spalling will continue until repointing is necessary. Air entrainment brings the solution to the problem.

Entrained Air in Field Mortars

Air-entraining cements were developed to produce concrete for paving that would resist severe frost action and the effects of freezing and thawing. *Entrained air produces the same advantages in Alpha mortar cement.* Billions of minute, unconnected air bubbles provide a density that resists the entry of water and prevents freezing.



Non-Air-Entrained Mortar   Air-Entrained Mortar

(MAGNIFIED ABOUT 40 TIMES)

Journal of the American Concrete Institute Research Report Confirms Need for Air Entrainment in Mortar Joints.

An extended research project at Lafayette College resulted in these important conclusions regarding the durability of mortars subjected to moisture during freezing weather:

1. No cement-lime sand mortar was durable under freezing and thawing without entrained air.

2. An air-entraining agent could be used to make cement-lime mortars durable but more air was needed than furnished when an air-entraining cement was used.

3. A minimum air content of 11% in the field mortar was needed for ASTM C-270 types M, S and N mortars (Type N is a 1:1:6 cement-lime or a 1:3 masonry-cement mortar; types M and S have more Portland cement).

4. A minimum air content of 13% was needed for types O and K mortars (1:2:9 or 1:3:12).

5. Masonry-cement mortars were all durable without the need of an additional air-entraining agent.

Suggested Mortar Mix Specification for Unit Masonry

The following specification has been drawn up at the request of a number of architects to provide a simplified, brief specification.

A.I.A. File No. 3-A

1. SCOPE:

This division of the specifications covers mortars for all types of masonry work indicated on the drawings and in the specifications. The mortar shall be prepared, tested and used as described in ASTM C-270, except as listed below.

2. MATERIALS:

All materials shall conform to ASTM C-270, except as listed below:

a. MASONRY CEMENT shall be Alpha mortar cement or equal and shall conform to ASTM Designation C-91, except that it shall have a water retention of not less than 75%.

b. AIR-ENTRAINING AGENTS, if needed, for use in hand mixes shall meet ASTM Designation C-260.

3. PROPERTY SPECIFICATIONS:

All field mortars shall be mixed, tested and used according to ASTM Designation C-270, except as follows:

No type O or K mortars shall be used in this project. Type N masonry-cement mortars shall be used for all masonry work, except where otherwise indicated. If high strength is required, a type M or S mortar may be designated. No lime shall be used in any mix.

4. PROPORTION SPECIFICATIONS:

The ASTM C-270 proportion specification shall apply except that no type O or K mortars shall be permitted in the work covered by these specifications. No lime shall be used in any mix.

5. MIXING:

All mortars in the field shall be mixed with a machine mixer for at least 5 minutes after all materials are in the drum. Hand mixing will only be permitted with written permission from the architect. If hand mixing is used, the air content of the mortar in the field shall be checked with an air meter to make certain that the air entrained is in excess of 11%. If the air entrained is less than 11%, an air-entraining agent shall be added in sufficient quantity to bring the air content of the field mortar up to 11%.

6. COST OF TESTS:

The cost of any required tests shall be borne by the contractor. Manufacturers mill test reports are acceptable for cement, masonry cement and air-entraining agents.

Reprints of this advertisement are available on request.

ALPHA

PORTLAND CEMENT COMPANY

Alpha Building, Easton, Pa.

OFFICIAL PROPOSALS

RATE: **The rate for Official Proposal advertising is $2.40 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.**

CLOSING DATE: **Friday 10:30 A.M. for issue dated the following Thursday.**

SEND COPY TO: **Official Proposal Division,**
Engineering News-Record
Class. Adv. Div.,
P. O. Box 12, N. Y. 36, N. Y.

Bids: December 29, 1960

New Jersey Turnpike Authority

CONTRACT NO. R-82

Proposals are invited for Contract No. R-82 which involves the construction of a Charter Bus Stop, which includes grading, paving, drainage and structures at Service Area 7S on the New Jersey Turnpike in Middlesex County, New Jersey.

The principal items of work include:

Stripping	30	AC.
Topsoiling	90,000	S. Y.
Roadway Excavation	72,000	C. Y.
Macadam Base Course 7½" Thick	35,000	S. Y.
Asphaltic Concrete Pavement 4½" Thick	35,000	S. Y.
Type "F" Shoulder	3,700	S. Y.
Concrete Curbing	19,000	L. F.
Lighting Conductors	35,000	L. F.
Lighting Standards and Luminaires	69	Each
Foundation Excavation	350	C. Y.
Concrete in Structures	1,740	C. Y.
Cast-in-Place Concrete Piles	1,200	L. F.
Structural Steel	400,000	Lbs.
Reinforcement Steel	240,000	Lbs.
Guard Rail	3,000	L. F.
Signs	34	Each

Proposals will be received at the New Jersey Turnpike Authority Administration Building, New Brunswick, New Jersey, until 11:00 o'clock, Eastern Standard Time, on the morning of December 29, 1960, at which time and place said proposals will be publicly opened and read.

Each bidder must submit with his proposal a Contractor's Financial and Equipment Statement.

Contract documents may be examined during office hours on or after December 5, 1960, at the office of the Authority, and will be furnished upon payment of Fifteen Dollars ($15.00) for each set, not refundable.

NEW JERSEY TURNPIKE
AUTHORITY
Joseph Morecraft, Jr., Chairman
November 29, 1960 A-1
R-82

Bids: December 26, 1960

Notice to Contractors

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Eastern Standard Time, on December 22, 1960, by Henry A. Cohen, Director, Bureau of Contractors, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON OGDENSBURG PORT DEVELOPMENT, MADDEN DOCK VICINITY AREA TO FISH HATCHERY VICINITY AREA, PROJECT NO. 6057, ST. LAWRENCE COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. SM-177.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. Robert W. Sweet, District Engineer, New York State Department of Public Works, 444 Van Duzee Street, Watertown, New York.
(c) Mr. William Mende, Principal Building Construction Engineer, Department of Public Works, 270 Broadway, New York, City.

The deposit for a set of plans, specifications and proposal forms is $5.00. Refunds of deposits for plans, specifications and proposals will be made *only* in case the deposits of individual sets are $10.00 or more, per Chapter 835, Laws of 1960.

The Engineer's Estimate of cost for this work is $26,625.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,500.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidder."

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPERINTENDENT OF
PUBLIC WORKS

Bids: December 19, 1960

Sanitary Outfall Sewer

Sealed bids for the construction of a Sanitary Outfall Sewer, will be received by the Board of Trustees of the Village of Webster at the Village Hall, 30 West Main Street, Webster, New York, until 8:00 o'clock, P.M. E.S.T. on the 19th day of December, 1960.

Bidding forms can be obtained and plans and specifications examined at the office of the Village Clerk at Webster, New York, or the office of The Lozier Company, Engineers, 10 Gibbs Street, Rochester, New York.

Copies of plans and specifications may be obtained upon the payment of ten dollars ($10.00) for each set, which will not be refunded.

The work consists of the construction of:

SECTION "A"—approximately 13,500 feet of 16", 21" and 24" Sanitary Sewers and Appurtenances, and

SECTION "B"—approximately 3,700 feet of 24" Sanitary Outfall Sewer in Lake Ontario.

Wilson O'Dell
VILLAGE CLERK

Bids: December 22, 1960

Notice to Contractors

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Eastern Standard Time, on December 22, 1960, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON INTERSTATE ROUTE 570-1, FORMAN AVENUE TO ERICKSON STREET, NEW PROJECT NO. 1-690-3(1)214, ITEM 57B, CITY OF SYRACUSE, ONONDAGA COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. FA-SM-176.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. Earl E. Towlson, District Engineer, New York State Department of Public Works, 333 East Washington Street, Syracuse, New York.
(c) Mr. William Mende, Principal Building Construction Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. Refunds of deposits for plans, specifications and proposals will be made *only* in case the deposits of individual sets are $10.00 or more, per Chapter 835, Laws of 1960.

The Engineer's Estimate of cost for this work is $16,175.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidder."

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPERINTENDENT OF
PUBLIC WORKS

U. S. Government

District of Columbia—Highway Construction—Dept. of Hwys. & Traffic, D. C., Nov. 25, 1960. SOUTHWEST FREEWAY—INNER LOOP GRADING BETWEEN STATION 105 PLUS 00 AND STATION 124 PLUS 00 INCLUDING BRIDGE AT SEVENTH ST., FEDERAL AID INTERSTATE PROJECT I-95-1(22)1—Invitation C-6155-H, consisting of 138,600 cu. yds. unclassified excavation; 460,800 lbs. reinforcing steel; 567,400 lbs. structural steel; 5,946 cu. yds. BB substructure concrete; 22,757 cu. ft. stone masonry facing, and 15,534 cu. ft. Class A dimensioned masonry. (Wage rates have been predetermined by the Labor Dept.) Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Room 404, 499 Pa. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D. C. Treasurer (Phone NA 8-6000, Ext. 2378). SEALED BIDS to be opened 3:00 PM, EST, Dec. 20, 1960, in Room 424, 499 Pa. Ave., N.W.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5453) will be received at Fargo, North Dakota, until 10 a.m., Central Standard Time, January 10, 1961, for furnishing labor and materials for Stage 05 Additions to Jamestown Substation, Transmission Division, North Dakota, Missouri River Basin Project. Location Jamestown, North Dakota. Principal items are 1,500 cu. yds. excavation; Lump Sum, constructing Dispatchers Building; 120,000 lbs., furnishing and erecting structural steel; and other work. Completion time 290 days. For particulars, address Bureau of Reclamation, P. O. Box 2553, Billings, Montana; P. O. Box 1993, Fargo, North Dakota; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

Sealed bids for extension and remodeling at the U.S. Post Office & Courthouse, Philadelphia, Pa., Project No. 36906, will be received until 2:00 P.M., E.S.T., January 10, 1961, and then publicly opened. Bidding material may be obtained after 12/5/60, from the Business Service Center, General Services Administration, 250 Hudson Street, New York 13, N. Y.

Contractors Watch
This Section—

for new projects. Publish your announcements through the proposal sections of *Engineering News-Record* and get their bids.

EMPLOYMENT OPPORTUNITIES

NATIONAL COVERAGE

DISPLAYED RATE:

The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

DECEMBER 22ND
ISSUE
CLOSES
DECEMBER 12TH

UNDISPLAYED RATE:

$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box numbers—count as 1 line.

Discount of 10% if full payment is mad in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division of
ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.

CONSTRUCTION ENGINEER

A newly created position exists in our organization for a construction engineer, age 27-35. Requirements include a BS degree in civil or mechanical engineering and a minimum of five years of varied experience in office and field plant design, specification writing, cost estimating, supervision and inspection of construction, mechanical work and material handling equipment. Our associates know of this advertisement. Excellent starting salary and fringe benefits. Reply in the strictest confidence stating how you can add to our organization's rapid, sound expansion. State age, education, experience, and salary requirements. Address

P-5750, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED
Manufacturer Representatives

calling on architects and engineers to act as franchised agents for established concrete form concern.. Send all information including names of concerns now represented to:

RW-5728, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

ADDRESS BOX NO. REPLIES TO: Box No.
Classified Adv. Div. of this publication.
Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• POSITIONS VACANT

Draftsmen, Structural—Experienced, Checkers and detailers of structural steel shop dwgs. Relocation expenses. Fink & Zwecker Co., 1100 Crescent Ave., N.E., Atlanta 9, Ga.

Estimator — For established contractor in Deep South Metropolitan area, specializing in Heavy Construction, Foundations and Sewer and Water Plants. Graduate Civil Engineer, Age 30 to 38 preferred. P-5645, Engineering News-Record.

Sanitary Engineer. Civil or Sanitary Graduate preferred. Location Lancaster, Pennsylvania. Established consulting firm has permanent position for young engineer. Experience or training in design of water and sewage facilities and treatment plants desired. Send complete resume with references and salary desired to H. F. Huth Engineers, Inc., 53 North Duke Street, Lancaster, Penna.

Registered Civil Engineer to serve as project engineer in the design of municipal water and sewage treatment facilities. Substantial prior treatment experience required. Salary open, age limit 40 years. Parker and Associates, Consulting Engineers, 1714 Ninth Street, Greeley, Colorado.

Production manager for Tennessee plant producing prestressed concrete members for buildings and bridges. Good opportunity for qualified, experienced man with engineering background. Send resume of experience and educational background. P-5765, Engineering News-Record.

Wanted: Graduate Civil Engineer for responsible charge of Engineering Section in City of Bettendorf Public Works Department. Good opportunity for advancement and development of Engineering Section in the fastest growing city in Iowa. Starting salary $5,800.00 to $6,300 depending on experience and qualifications. Write H. W. Wiesen, Director of Public Works, City Hall, 1617 State Street, Bettendorf, Iowa.

Highway Maintenance Superintendent—Senior personnel needed to complete technical party in South Vietnam. Will reside in the field and exercise supervision of local personnel and equipment involved in highway maintenance operations in a general area. Must be qualified to train operators for equipment such as graders, trucks, mowers, etc., and see to routine adjustments and repair thereof. Must be competent to handle field reports, payroll forms, and exercise independent judgment pertaining to problems of proper roadway maintenance. Ten years experience desirable in highway maintenance or construction in above described duties. Two year employment contract. Travel in single status preferred. Open to U.S. Citizens only. Salary to $11,250 per annum plus housing and subsistence. Send resume or write for application blank to Capitol Engineering Corporation, Dillsburg, Pennsylvania.

CHEMICAL OR MECHANICAL ENGINEERS

One of the world's largest pharmaceutical companies has available varied and challenging assignments in Plant Engineering. About five years' experience required in the process industries. Applicants should be capable of assuming full responsibility for project design and coordination. Knowledge of construction methods and chemical maintenance desirable.

Send resume to Personnel Dept.

Parke, Davis & Company, Detroit 32, Mich.

CIVIL ENGINEERS

Civil Engineers with 2 to 15 years of experience in layout and design of dams, intakes, powerplants, spillways, canals, etc., to fill immediate openings in a design office. Some experience in writing reports desirable but not essential. Please send complete resume to Personnel Manager.

HARZA ENGINEERING COMPANY
400 West Madison Street, Chicago 6, Illinois

• POSITIONS VACANT

Shop Superintendent — Senior personnel needed to complete Advisory Group in South Vietnam. May reside in the field and have supervision in an advisory capacity over all shop personnel, equipment repair, parts room operation, and service and repair of all equipment. Will be required to advise on purchase of parts and supplies, and must be qualified to train mechanics, welders, machinists and stores employees. Will supervise as an advisor the use of all reporting forms such as time cards, requisitions, repair work orders and equipment records. Must be familiar and experienced in the service and repair of all types of automotive and other power equipment, heavy and light. Ten years experience desirable in supervising repair of highway maintenance and construction equipment. Travel in single status perferred. Open to U.S. Citizens only. Two year employment contract. Salary to $10,500 per annum plus housing and subsistence. Send resume or write for application blank to Capitol Engineering Corporation, Dillsburg, Pennsylvania.

Civil Engineer. Must have Florida registration and executive qualifications with road, sewer and water experience. 30 to 45. Good opportunity. State all first letter. Members of our firm know of this ad. P-5762, Engineering News-Record.

Construction Manager, to handle Capehart Housing Projects in Northeastern States, contracts now on books. Reply with full resume of background, experience and expected salary. Data held confidential. P-5733, Engineering News-Record.

Engineer-Draftsmen, familiar with wood framing and prefabricated construction on Long Island also Connecticut. State background and salary expected. Confidential. P-5739, Engineering News-Record.

Sales Engineer—Civil Preferred. Must have strong interest in sales, but experience not necessary. We are looking for several qualified men in 23-30 age group. Excellent opportunity for growth with large organization to work in construction specialty field. Salary plus liberal compensation. Automobile, expenses and many fringe benefits furnished. Send complete details. Strictly confidential. Write Johns-Manville Prod. Corp., Celite Division, 22 East 40th St., New York 16, N. Y.

(Continued on following page)

Department Head
FOREIGN OPERATIONS

Excellent opportunity for person with senior experience in management of large diversified foreign operations to head new department of expanding general contractor. Immediate opening.

Please submit a concise resume including previous experience and salary requirements.

Director of Personnel

BLOUNT BROTHERS
Construction Co.

Home Offices: 79 Commerce Street
Montgomery, Alabama

WATER ENGINEER

(Civil Service Classification
Civil Engineer II—Hydraulic)

Monthly Salary Range $583 to $714

Job Requirements: Hydraulic design of water supply, treatment and pumping facilities. Report preparation and studies for long range planning of water supply facilities for large metropolitan area.

Education and Experience Requirements: B.S. in Civil or Sanitary Engineering and five (5) years experience in above special fields—or—the equivalent combination of education and experience in lieu of a degree. College transcripts must be filed with application for college credits claimed. *Additional data will be sent to all applicants. Send complete summary of your education and experience to:*

Mr. Henry W. Korner, *Executive Secretary*
Civil Service Board, City of Miami
3318 Pan American Drive Miami, Florida

EMPLOYMENT OPPORTUNITIES

• POSITIONS VACANT

(Continued from preceding page)

Building Construction Superintendents and Construction Estimators. Positions open now—send resume to: Personnel Department, Box 236, Gouverneur, New York.

• POSITIONS WANTED

Superintendent capable complete charge experienced heavy excavation and grading engineering and estimating. Now employed, available soon. P.O. Box 118, Des Moines 1, Iowa.

Sales Eng.—Estimator, GC, sub-contract (no mechanicals). Strong Met. N.Y., Northeast U.S. experience. P.C., P.S. conc. specialist. PW-5640, Engineering News-Record.

Graduate, licensed civil engineer with extensive design, construction, and managerial experience over the past twenty years seeks position at management level with General Contracting organization. Available immediately. Willing to relocate anywhere USA or overseas for responsible position with adequate compensation. Will consider offers to share risks and profits. PW-5652, Engineering News-Record.

Executive Female: 15 yrs exp all phases genrl const, efficient coordinator, administrator, mgr., atty, govt contracts claims. PW-5657, Engineering News-Record.

Structural Engineer, P.E., B.S.C.E., M.S. Ph.D. experienced thoroughly in structural steel and R.C. design of industrial plants, bridges, heavy foundations. Broad backgrounds. Mid-forties. Desire responsible position. Location desired central and east of Midwest. PW- 5712, Engineering News-Record.

Engr, 39, Plant, Heavy Piping control systems. L.P. steam, construction contracts office & field, Boston & Vic. PE, BSCE, LLB. PW-5704, Engineering News-Record.

Construction Management Executive. I desire top position with full responsibility creating and bringing new business for progressive general and heavy construction contractor. Can organize top management and supervision of large projects with associates of proven experience. Hours, travel no object—will go anywhere—work all profitably necessary hours. Extensive knowledge and successful experience in estimating; contract negotiation and administration; organization; sales; layout; specification and design work; scheduling; customer relations; change order and punch list administration; and labor relations and negotiations. Successful record of progressively better project profits. Resume and personal data on request. Would appreciate personal interview at your convenience. PW-5700, Engineering News-Record.

Chief Estimator—Engineer. 12 years experience commercial, industrial, heavy construction. Capable of handling jobs from takeoff to completion. Presently employed but willing to relocate. PW-5364, Engineering News-Record.

Construction Supt. General Construction. PW-4482, Engineering News-Record.

Construction Manager: Mechanical, some experience General Construction. Experience in Management, Estimating, Negotiating & Selling. From Rumor to Reality. Following of top Construction Men. Good Customer Contacts. Desire position with opportunity. Resume on request. PW-5759, Engineering News-Record.

Project Manager—33 years experience Industrial and heavy construction, mechanical and structural projects. Estimates and negotiations to completion. Location immaterial or will travel. Successful record as Manager of Construction Division for National Constructor. Education M.E. PW-5737, Engineering News-Record.

Estimator-engineer-administrator, CE,PE.LS, (N. J.) experienced paving, utilities, bridges, desires responsible position heavy construction. PW-5763, Engineering News-Record.

Precast Prestress Supt. with const. experience. Mid Atlantic preferred. PW-5738, Engineering News-Record.

Project Manager; Grad. Engr. P.E. Age 38. Experienced bid to completion in estimating buying subs, layout, supervision, and payment on industrial, hi-rise, hospital, treatment plant, and highways. Desire permanent location New York-Philadelphia area. Available January. PW-5764, Engineering News-Record.

Senior Estimator, Project Manager, seeks permanent career opportunity with General Contractor. Age 33, progressive experience in Commercial, Industrial, and Gov't. Building Construction. PW-5756, Engineering News-Record.

SEARCHLIGHT SECTION CLASSIFIED ADVERTISING

BUSINESS OPPORTUNITIES - EQUIPMENT - USED or RESALE

DISPLAYED RATES

The advertising rate is $25.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured 7/8 inch vert. on one col., 3 columns—30 in. to a page.

EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

UNDISPLAYED RATES

$2.40 a line, min. 3 lines. To figure advance payment count 5 average words as a line.

BOX NUMBERS count as one additional line in undisplayed ads.

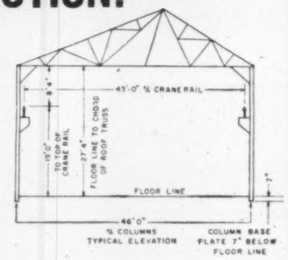
DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads.

Immediately Available! **MODERN INDUSTRIAL STEEL BUILDINGS**

FOR SALE—FOR RE-ERECTION!

Former Aluminum Co. of America Plant at Maspeth, N.Y. (New York City)—750,000 Sq. Ft. Match Marked & Dismantled for Re-Erection

(Loaded F.O.B. New York City Area)


43'-0" ℄ CRANE RAIL
8'4"
19'0" TO TOP OF CRANE RAIL
27'4" FLOOR LINE TO CHORD OF ROOF TRUSS
FLOOR LINE
7"
46'0" ℄ COLUMNS
TYPICAL ELEVATION
COLUMN BASE PLATE 7" BELOW FLOOR LINE

●

300,000 SQ. FT.

AVAILABLE IN ANY LENGTH — in 19 ft. multiples — One-story Mill Type — 46 ft. Clear Span center-to-center columns — 19 ft. 7 in. to top of Crane Rail — 27 ft. 11 in. floor line to chord of roof truss — Equipped with crane runways.

●

(1) BUILDING 42 FT. 6 IN. x 82 FT. 6 IN.

45 ft. to top of Crane Rail . . . 53 ft. 4 in. to chord of roof truss — Equipped with 50 ton — 3 ton Auxiliary Heavy Duty Crane — Ideal for Electric Furnace or Heavy Duty Erection Shop.

These Buildings Ideal for Machine Shop, Manufacturing Areas, Efficient Warehousing, Assembly Shop, etc.

(17) NORTHERN ENGINEERING OVERHEAD TRAVELING CRANES

High Speed for Heavy Duty Services

ALL OFFERED AT CONSIDERABLE SAVINGS!

(DIAGRAMS FURNISHED FOR ALL STRUCTURES, MATCH MARKED AND READY FOR RE-ERECTION)

For Additional Information Write . . . Wire . . . Call

LIPSETT, INC. (Sales Agent)

405 LEXINGTON AVE.(CHRYSLER BLDG.), MUrray Hill 7-2700 PHILA. SALES OFFICE-TRinity 8-8100

(SAMUEL SONS IRON & STEEL CO. PROJECT)

FOR SALE

150 ton capacity Barge, six sections easily transported by truck. Built by Richmond Steel Co. Cost $19,000.00. Used once. Sell $12,000.00 with deck engine.

1955 Koehring 304 Crane, drag, clam with G. M. Diesel, long wide crawlers. Very good condition and appearance. Sell $10,000.00.

27E Koehring Paver with large water heater. Good condition and appearance. Ideal for bridges. Price $4,000.00.

CASE CONSTRUCTION CORP.,
Box 43, Mount Airy, Maryland

FOR SALE

Bucyrus Erie 51-B Crane
Bucyrus Erie 38-B Crane
Steel Tow Boat
Steel Deck Barge
Single Action Vulcan Hammers
Cleaver-Brooks Electric Boilers
McKiernan-Terry Pile Hammers
Allis Chalmers Diesel Tractor

Miscellaneous pile driving and marine construction equipment

HARRY A. THOMPSON, INC.
228 North LaSalle St.
Chicago, Illinois STate 2-8722

DON'T FORGET THE BOX NUMBER

ADDRESS BOX NO. REPLIES TO: Box No.
Classified Adv. Div. of this publication.
Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• BUSINESS OPPORTUNITY

Chemist Engineer: Wants to purchase partnership in small Engineering Company. Who wish to have partner competent to head a laboratory and design division specializing in water supply and related fields. Mature and experienced. BO-5752, Engineering News-Record.

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations Forty-eighth year.
WILSON *Engineering Corp.*
College House Offices HARVARD SQ. CAMBRIDGE MASS.

CONSTRUCTION SUPERVISION

Exclusive Training Course by mail for top positions. Publishers Manual of Advanced Construction Management. Send postcard for details.

National Schools of Construction
Est. 1952
Satsuma, Florida

FOR SALE OR RENT

AMERICAN REVOLVER R-15 WHIRLEY GANTRY CRANES.
25 TON IND. BH. #5 DIESEL LOCO. CRANE.
40 TON IND. BH. #8 LOCO. CRANE. 1951.
40/50 TON AMERICAN #508 DIESEL LOCO. CRANE. NEW 1942.
50 TON AMERICAN STIFFLEG DERRICK AND 3 DRUM AMERICAN HOIST.
45 TON GEN. ELEC. DIESEL ELEC. LOCOS.
25 TON GEN. ELEC. DIESEL ELEC. LOCO.
1 YD. LORAIN L-50 CRANE. NEW 1951.

WHISLER EQUIPMENT CO.
1905 Railway Exchange Bldg., St. Louis 1, Mo.
CHestnut 1-4474

Capitol CRANE CORP.

RENTALS
PILE DRIVING—ERECTION

50-ton crawlers with leads and accessories
5-ton Hydro-cranes
25-ton Mobiles
40-ton Mobiles

Pile-drving accessories for truck cranes
Booms to 150 ft. with 40 ft. jibs

#27 N St. S.E. Wash. D.C.
Lincoln 6-2616

SURVEYING INSTRUMENTS

USED • REBUILT • SALE
RENT • REPAIRING

TRANSITS AND LEVELS

New or Rebuilt
Sale or Rent

Headquarters for REPAIRS — any make — Factory Service We will also *buy* your old instruments or take them in *trade*.

A complete line of Engineering Instruments and equipment for field or office. Write for catalog NRL 112.

WARREN-KNIGHT CO.
Manufacturers of Transits and Levels
136 No. 12th St., Philadelphia 7, Penna.

TRANSITS & LEVELS

Various Makes
NEW & REBUILT

Fully equipped modern shops — all makes and models repaired — all work guaranteed — prompt service — complete line field supplies.

INSTRUMENTS RENTED

Midwest Distributors for W. & L. E. Gurley and Wild Heerbrugg Instruments

NATIONAL BLUE PRINT CO.
Established 1914.
210 S. Canal St. Chicago (6), Ill.

ALL MAKES

RE-BUILT
REPAIRS
RENT
REAL EXPERTS

BUFF

69 Dey St., New York WOrth 2-2797

IMMEDIATELY AVAILABLE

2—Mod. 150B (6 cu. yd.) Comb. Shovel-Dragline, Electric, Air Conditioned. Used less than 7000 hours	$210,000.00 ea.
8—Mod. LRVX Mack Tractors w/30 cu. yd. Mod. 137W Euclid Bottom Dump Trailers. New 1958	36,500.00 ea.
10—Mod. PH95A International Payhaulers w/30 cu. yd. Mod. PW20 Athey Bottom Dump Trailers. Tractors have new 425 H.P.-G.M. Engines	30,500.00 ea.
10—Mod. DW20 Cat Tractors w/30 cu. yd. Mod. PW20 Athey Bottom Dump Trailers, 67C Series	27,000.00 ea.
12—30 cu. yd. Mod. MX30 Southwest Bottom Dump Trailers	5,000.00 ea.
10—Mod. DW20 Cat Tractors w/456P Cat Modified Scrapers, 67C Series	27,000.00 ea.
10—D8 Cat Tractors w/PCU's and Dozers, 14A Series	18,500.00 ea.
5—D9 Cat Tractors w/PCU's and Dozers, 18A Series	26,500.00 ea.
6—Mod. 12 Cat Motor Patrols, 8T and 80C Series	8,500.00 to 10,500.00 ea.
9—15 cu. yd. Mod. 63TD Euclid End Dumps	24,000.00 ea.
4—60" x 20' Link Belt HD Manganese Apron Feeders	12,500.00 ea.
2—30" x 60" Gruendler Single Roll Impact Crushers	9,500.00 ea.
2—6' x 12' Tyler Mod. F800 Single Deck Screens	6,000.00 ea.

CALL, WIRE, or WRITE for Complete Bulletin!

TRINITY DAM CONTRACTORS

10 West Orange Avenue South San Francisco, Calif.
***Phone:* PLaza 6-0300, Ext. 279**

FORSYTHE EQUIPMENT CO., INC.

MANITOWOC SPEEDCRANES

RENTALS

Capacities to 70 Tons
Booms to 140 ft. and 30 ft. jibs
Special rates on long rentals

Exeter 2-6125 37-11 Vernon Blvd.
Long Island City 1, New York

SAVE ON YOUR **TRACK** CHAINS ROLLERS SPROCKETS IDLERS, ETC.
for Caterpillar—International—Allis Chalmers
BRAND NEW—GUARANTEED

SEABOARD EQUIPMENT CO., INC.
161-10B Jamaica Ave.,
Jamaica 32, N. Y.
AX-7-4422

U. S. ARMY EE-8

Telephone, fully reconditioned at 2 for $35.00. Any number can be used on the same line. Wire 1¢ per ft. or $35.00 per mile. Write for complete telephone list.

TELEPHONE ENGINEERING CO.
Dept. ENR 130 Simpson, Pa.

PUMPS

2—35/40 Ton #8 Ind. Brownhoist locomotive cranes, diesel eng—air controls
1—30-ton Mdl F Ohio locomotive crane
2—45-ton G.E. diesel elec. std. ga. locomotives
1—25-ton G.E. diesel elec. std. ga. locomotive

ECA
EQUIPMENT CORPORATION OF AMERICA

Box 608-J, Clifton Heights, Pa.
Box 43-J, Coraopolis, Pa. (sub. of Pittsburgh)

FOR SALE

One Fuller-Clark Portable Automatic Concrete Batching Plant with four aggregate compartments totalling 150 tons and one cement compartment totalling 160 barrels; also a ground cement storage bin holding 375 barrels with bucket elevator for charging and recirculating. Includes two cubic yard Smith Tilting Mixer, air operated and a three cubic yard concrete collecting hopper positioned so that flat trucks carrying bottom dump concrete buckets can be run under the hopper. Also by-pass chute for charging batches in transit-mix trucks. The weighing hopper has a capacity for a three cubic yard batch. Compressor and controls are powered by electric motor 220 h.p. three phase 60 cycle and electronic button operated panel controls all operations. Includes also automatic metering water control and pump, cement hopper for receiving cement from trucks, operating platform and inspector's separate room, stairs, railings and ladder guards; also equipped with automatic fine aggregate moisture control and provisions for batching air-entraining admixture. This plant used on one job only, at Bear Creek Reservoir for Nello Teer, Inc. Now located at White Haven, Penna., dismantled and ready for shipment and re-erection.

Price complete	$32,000.00
Without Smith Tilting Mixer	$24,000.00

COON CERTIFIED CONCRETE, INC.
278 Union St. Luzerne, Penna.
BUtler 7-9601

IMMEDIATELY AVAILABLE
FOR SALE

1—Model 88B (4 cu. yd.) Bucyrus Erie Comb. Shovel-Dragline powered by VT12 Cummins Engine with Torque Convertor. 90′ Boom.

Price—Porterville, Calif. $80,000.00

Call

GUY F. ATKINSON COMPANY

10 W. Orange Ave. So. San Francisco, Calif.

Phone: PLaza 6-0300, *Ext.* 279

NORTHWEST
80D Shovel
EXCELLENT CONDITION
In Our Yard Ready To Go
HODGE & HAMMOND, INC.
720 Garrison Ave., New York 59, N. Y.
Phone: Kilpatrick 2-2400

High Speed in 6x6's
NEW ISSUE TRUCKS
GMC! MACK! REO "Eager Beaver!"
- *Tandem Axle*
- *Front Wheel Drive*

For specifications, prices, delivery, write
MEMPHIS EQUIPMENT COMPANY
P.O. Box 2852, Dept. E., Memphis, Tenn.
NATION'S LARGEST ARMY TRUCK DEALER!

PILING

SURPLUS NEW and USED For Sale, Wanted or Rent

STEEL SHEET
PILING
by DIALING
Call St. Louis Collect
CHestnut
1-4474

RENT, SELL OR BUY
H-BEARING PILE
FAST SERVICE
NATION-WIDE STOCKS
LOW RATES
ALL LENGTHS
ALL SECTIONS

PILE DRIVING EQUIPMENT
NORTH, SOUTH, EAST or WEST

MISSISSIPPI VALLEY EQUIPMENT CO.
1908 Railway Exchange Bldg.
St. Louis 1, Mo. CHestnut 1-4474

H-BEARING PILES
8″ x 36# — 12″ x 53#
10″ x 42# — 14″ x 73#
Immediate Shipment — Other Sizes Available
Chicago—Buffalo—Memphis—Cincinnati
Steel Sheet Piling—Pile Hammers
WHISLER STEEL PILING CO.
CHestnut 1-4474
1908 Railway Exchange Bldg., St. Louis 1, Mo.

Faster From Foster
STEEL-SHEET
PILING
All sections from our regular stocks
L. B. FOSTER CO.
Pittsburgh 30 · New York 7 · Chicago 4 · Houston 2
Los Angeles 5 · Atlanta 8 · Cleveland 35

STEEL SHEET PILING
LARSSEN and ROMBAS Sections
STOCKS AVAILABLE IN:
- Linden, New Jersey
- Ft. Lauderdale, Florida
- Houston, Texas

WESTERN SERVICES CORPORATION
601 E. Linden Ave., Linden, N. J.
MArket 4-4000 HUnter 6-4000

In Florida Call: Port Everglades Steel Co.
Ft. Lauderdale—JA. 4-6545
In Houston Call: G. Oliver—CA. 4-7234

When you need
PILING . . . fast

use this section, as many contractors do, as a piling buying directory. It can save you time when you want to know quickly, where to buy good new or used piling.

STEEL SHEET PILING

AVAILABLE FOR PROMPT SHIPMENT

Pcs.	*Section*	*Length*	*Location*
130	MP-101	40 to 45 ft.	Indiana
450	MP-116	20 to 60 ft.	Missouri
144	MP-116	24 to 31 ft.	Nebraska
139	MP-112	20 to 22 ft.	Illinois
310	MP-116	20 to 60 ft.	Tennessee
384	MP-115	15 to 60 ft.	Missouri
440	MP-115	15 to 60 ft.	Illinois

CONMACO, INC.
PHONE DRexel 1-3930
804 KANSAS AVE., KANSAS CITY, KANSAS

PIPE
Surplus New & Used
FOR SALE, WANTED OR RENT

Call: HYACINTH 7-4900
PIPE, VALVES & FITTINGS
PILING • CULVERTS
ASBESTOS-CEMENT PIPE • ALUMINUM PIPE
ALBERT PIPE SUPPLY CO., Inc.
103 VARICK AVE., BROOKLYN 37, N.Y.

"contractors"
We have used pipe, 1½″ thru 8″
STEEL AND SPIRAL
We also have H & I beams (used)
Check our economy prices & service
BENSON-STEAD CO.
P.O. BOX 98 Portville, N. Y.

ASSOCIATED PIPE & FITTING CO., INC.
PILING PIPE SHELLS MANDREL FITTINGS
"H" BEARING PILE-POINTS AND SLEEVES
TIMBER SPLICERS AND SHOES
CULVERTS CIRCLE ARCH SECTIONAL
262 RUTHERFORD BLVD., CLIFTON, N.J. • PR 3-8400

DAVIDSON
PIPE SUPPLY CO. INC.
Seamless and Welded Steel Pipe
Fittings, Valves, Pipe Fabricating
Call GEdney 9-6300
50th St. & 2nd Ave., B'klyn 32, N. Y.

STEEL PIPE
NEW — STRUCTURAL — RECONDITIONED
VALVES & ALL TYPE FITTINGS
COMPLETE FABRICATION FACILITIES
GREENPOINT PIPE SUPPLY CORP.
341 Stagg Street, Brooklyn 6, N. Y. EV. 6-7200

RAILS-TIES
TRACK ACCESSORIES

RAILS
MIDWEST STEEL CORP.
502 DRYDEN STREET
CHARLESTON, W. VA.

RAILROAD Cross and Switch **TIES**
Promptly from adequate stocks
NEW and USED *(as available)*
GILLIS & COMPANY
134 Breckenridge Lane Louisville 7, Ky
TW 5-9484

If there is anything you want
that other readers can supply
OR . . . something you don't want—
that other readers can use—
Advertise it in the
SEARCHLIGHT SECTION

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names

Additional cards on following pages

NEW ENGLAND

Goodkind & O'Dea
Consulting Engineers
Design and Supervision
Foundations, Structures, Highways
1214 Dixwell Ave. Hamden, Conn.
610 Bloomfield Ave., Bloomfield, N. J.
325 Spring Street, New York 7, N. Y.
108 W. Lake Street, Chicago 1, Ill.

Fay, Spofford & Thorndike, Inc.
Engineers

Industrial Plants Incinerators
Water Supply, Sewerage, Drainage
Bridges Express Highways
Port and Terminal Work Airports

Designs Investigations
Supervision of Construction

Boston 8, Massachusetts

Jackson & Moreland, Inc.
Jackson & Moreland Int'l., Inc.
Engineers and Consultants

Electrical—Mechanical—Structural

Design and Supervision of Construction
-:- for -:-
Utility, Industrial and Atomic Projects

Surveys—Appraisals—Reports

Machine Design-Technical Publications
Boston Washington New York

Chas. T. Main, Inc.
Engineers
Design and Supervision of Construction for Industrial Plants—Electrical, Steam and Hydraulic Engineering—Investigations, Reports, and Appraisals.
Boston, Mass. Charlotte, N. C.

Metcalf & Eddy
Engineers
Soils, Foundations, Waterworks, Sewage Works, Drainage, Irrigation, Flood Control, Refuse, Industrial Wastes, Airports, Highways, Military Projects, Industrial and Commercial Facilities.
Statler Building, Boston 16,
Massachusetts

Moore Survey & Mapping Corp.
Engineers-Photogrammetrists-Surveyors
Geodetic Control—Construction Layout
Aerial Topographic Surveys—Tax Maps
Hydrographic Surveys—Photogrammetry
29 Grafton Circle—Shrewsbury, Mass.

MIDDLE ATLANTIC

Airways Engineering Corp.
Airports, highways, dams, fuel storage, pipe lines, aerial topographic mapping.
1212 - 18th St., N.W.,
Washington 6, D. C.
Phone: REpublic 7-8131

Ewin Engineering Corporation
Designers of Port Facilities, Foundations, Industrial Plants, Bridges, Highways, Sewage Disposal and Urban Renewal.

5104 MacArthur Blvd. N.W.
Washington, D. C.

DuPont Plaza Center, Miami 32, Fla.
150 Savannah St. Mobile, Ala.

Whitman, Requardt & Associates
Engineers—Consultants
Civil—Sanitary—Structural
Mechanical—Electrical
Reports, Plans, Supervision, Appraisals
1304 St. Paul St., Baltimore 2, Md.

Louis Berger & Associates
Consulting Engineers
Studies—Design—Supervision
Highways—Structures—Airfields
177 Oakwood Avenue Orange, N. J.
2nd & Locust Streets Harrisburg, Pa.
200 S. Main St Salt Lake City, Utah
8 rue de Neuchatel Geneva, Switzerland
48 Baselerstrasse, Frankfurt, Germany

Joseph S. Ward and Associates
Consulting Soil and Foundation Engineers
Site Investigation, Boring Supervision, Laboratory Soil Testing, Foundation and Pavement Analysis and Design, Construction Supervision, Engineering Reports and Consultation
91 Roseland Avenue Caldwell, N. J.
Jefferson Building Phila., Penn.

Victor J. Lo Pinto Associates
Consulting Engineers
SOILS - FOUNDATIONS - HIGHWAYS
Investigation - Design - Supervision
Sub Surface Exploration
Laboratory and Field Tests
Land Development Engineering
58 Branchport Ave., Long Branch, N. J.

Albert C. Jones Associates
Consulting Engineers
Private and Municipal Engineering
Sewerage-Sewage Treatment
Water Supply and Distribution
Investigations and Appraisals
Photogrammetric Engineering
Aerial Maps
223 High St. Mount Holly, New Jersey

Edwards and Kelcey
Engineers and Consultants
Traffic Transportation Parking
Expressways Airports Public Works
Surveys - Reports - Design - Supervision
3 William Street, Newark 2, New Jersey
Boston Salt Lake City New York
Providence Minneapolis

Porter & O'Brien
O. J. PORTER & COMPANY
CONSULTING ENGINEERS
Airports — Highways — Expressways — Buildings — Bridges — Dams — Harbors — Foundations — Stabilization — Pavements
Reports, Designs & Supervision
415 Frelinghuysen Ave., Newark 5, N.J.
4201 Sunset Blvd. Los Angeles 29, Cal.
1421-47th Avenue Sacramento 22, Cal.

Boswell Engineering Co.
Consulting Engineers
Highways, Bridges, Airports, Municipal
Ridgefield Park, N. J.
West Nyack, New York
Salt Lake City, Utah
Anchorage, Alaska

John Clarkeson
Consulting Engineer
Civil Engineers—Consulting Services
Highways, Airports, Bridges
Surveys, Waterfront Facilities
Room 203, Del & Hudson RR Bldg.
Albany, N. Y.

Empire Soils Investigations, Inc.
Subsurface Investigations and Soil Testing.
Overburden and Rock Core Drilling
Auger—Test Pits—Load Tests
Laboratory Analysis
105 Corona Ave. Groton, New York

B. K. Hough
Consulting Engineer
Soils & Foundation Engineering
Site investigations, soil testing, design analysis for earthworks, foundations and pavements, field inspection, engineering reports, consultation.
121 E. Seneca St. Ithaca, New York

Ammann & Whitney
Consulting Engineers

Design and Supervision of Construction of Bridges, Highways, Expressways, Buildings, Special Structures, Airports and Airport Facilities

111 Eighth Avenue, New York 11, N.Y.

Milwaukee - Washington - Philadelphia
Paris - Athens - Tehran

M. C. Tomasetti
Consulting Engineers—Surveyors
Designs, Construction Supervision
Highways—Airfields—Structures
Soils—Foundations—Pavements—Drainage
Materials Investigations
Site Designs, Subdivisions, Surveys
Greenwich, Conn., New Rochelle, N. Y.

Blauvelt Engineering Co.
CONSULTING ENGINEERS

Highways,
Bridges,
Reports

New York, N. Y. Philadelphia, Pa.
Woodbury, N. J. Crystal Lake, Ill.

Clinton Bogert Engineers
Consultants
Clinton L. Bogert Ivan L. Bogert
Donald M. Ditmars Robert A. Lincoln
Charles A. Manganaro William Martin
Water & Sewage Works Incinerators
Drainage Flood Control
Highways and Bridges Airfields
145 E. 32nd St., New York 16, N. Y.

Bowe, Albertson & Associates
Engineers
Water and Sewage Works—Industrial Wastes — Refuse Disposal — Valuations —Laboratory Service
75 West St. 1000 Farmington Ave.
New York 6, N.Y. W. Hartford 7, Conn.

Brown Engineers
Brown Engineers International
Architects—Engineers—Planners
Airports, Bridges, City Planning, Commercial Buildings, Dams, Highways, Housing, Hydraulics, Hydroelectric Power, Industrial Plants, Ports, Railroads, Sewerage, Transportation Studies, Urban Renewal, Water Supply.
Studies—Design—Management
Supervision of Construction

Coliseum Tower
10 Columbus Circle
New York 19, N. Y.

Buck, Seifert and Jost
Consulting Engineers
Water Supply — Sewerage — Hydraulic Developments—Reports and Valuations, Chemical and Biological Laboratories.
New York City, 112 E. 19th St.

Ebasco Services Incorporated
ENGINEERS
CONSTRUCTORS
MANAGEMENT CONSULTANTS
Design and Construction
Financial and Operating Consultation
Investigations and Reports
Consulting Engineering
Appraisals
Two Rector Street, New York 6, N. Y.
140 S. Clark Street, Chicago 3, Ill.
1416 Commerce Bldg., Dallas 1, Texas
611 Equitable Bldg., Portland 4, Ore.
120 Montgomery Street,
San Francisco 4, Cal
1625 Eye Street, N.W. Wash. 6, D. C.

Gibbs & Hill, Inc.
Consulting Engineers
Water, Sewage & Industrial Waste Treatment Works — Roads, Bridges & Railroads—Conventional & Nuclear Power Generation — Electric Transmission & Distribution Systems—Industrial & Communication Facilities.
PENN STATION NEW YORK 1, N.Y.

Frederic R. Harris, Inc.
Consulting Engineers
New York, N. Y.
Norwalk, Conn. New Orleans, La.
Toronto, Canada The Hague, Holland

When you need a SPECIALIST in a hurry . . .
Engineering News-Record's Professional Service Section offers the quickest, most direct method of contacting consultants who may be available NOW.

Hardesty & Hanover
Consulting Engineers

Bridges
Fixed and Movable
Highways
Expressways, Thruways
Special Structures
Design, Supervision,
Inspection, Valuation

101 Park Avenue New York 17

Hazen and Sawyer
Engineers
Richard Hazen Alfred W. Sawyer
H. E. Hudson, Jr.
Water and Sewage Works
Industrial Waste Disposal
Drainage and Flood Control
360 Lexington Ave., New York 17, N.Y.

Howard, Needles, Tammen & Bergendoff
Consulting Engineers
Bridges, Structures, Foundations,
Express Highways
Administrative Services
Kansas City - Cleveland - New York

King & Gavaris
CONSULTING ENGINEERS

Associates:
W. Mack Angas
David Carsen
Dr. G. P. Tschebotarioff
Sidney Zecher
Bridges, Highways, Tunnels
Waterfront Structures, Reports
Investigations, Foundations
Design & Supervision of Construction
41 E. 42nd St., New York 17, N. Y.

Litchfield Whiting Bowne & Assoc.
Engineers—Architects
Sewage, Water, Bridges, Airports, Flood Control, Electrification, Hospitals, Schools, City Planning, Abbatoirs, Highways, Air Conditioning, Industrial Buildings, Military.
8 West 40th St., N. Y. 18, N. Y.
Rome Tehran Bangkok

Modern Engineering Corporation
Design—Consulting

62 William Street, New York, N. Y.

Moran, Proctor Mueser & Rutledge
Consulting Engineers

Foundations for Buildings, Bridges and Dams; Tunnels, Bulkheads, Marine Structures; Soil Studies and Tests; Reports, design and supervision.

415 Madison Ave., New York 17, N.Y.
Eldorado 5-4800

E. Lionel Pavlo
Consulting Engineer
Design, Supervision, Reports
Bridges, Highways, Expressways
Marine Structures, Public Works
Industrial Construction, Airports
642 Fifth Ave. New York 19, N. Y.

ALWAYS READY

Yes, these consultants are always ready to help you with any problem concerning engineered construction. Call on them with the assurance that you will be receiving the finest of professional advice.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names

Additional cards on preceding and following pages

Parsons, Brinckerhoff, Quade & Douglas

ENGINEERS

Bridges, Highways, Tunnels, Airports, Subways, Harbor Works, Dams, Canals, Traffic Parking and Transportation Reports, Power, Industrial Buildings, Housing, Sewerage and Water Supply.

165 Broadway New York 6, N. Y.

Malcolm Pirnie Engineers

Malcolm Pirnie Carl A. Arenander
Ernest W. Whitlock Malcolm Pirnie, Jr.
Robert D. Mitchell Alfred C. Leonard

MUNICIPAL AND INDUSTRIAL

Water Supply—Water Treatment
Sewage and Waste Treatment
Drainage—Rates—Refuse Disposal

25 West 43rd St., New York 36, N. Y.
2910 Grand Central Ave., Tampa 9, Fla.

The Pitometer Associates

Engineers

Water Waste Surveys
Trunk Main Surveys
Water Distribution Studies
Water Measurements & Special Hydraulic Investigations
New York, 50 Church St.

Alexander Potter Associates

Consulting Engineers

Water Works, Sewerage, Industrial Waste, Hydraulic Works, Reports, Designs, Appraisals.

50 Church St., New York, N. Y.

Praeger-Kavanagh

Engineers

126 East 38th St., New York 16, N. Y.

Seelye Stevenson Value & Knecht

Consulting Engineers

Richard E. Dougherty, Consultant

Airports, Highways, Bridges, Dams, Water Supply, Sanitation, Railroads, Piers, Industrial Plants, Reinforced Concrete, Steel, Industrial Waste Disposal, Foundations, Soil Studies, Real Estate Development

Civil — Mechanical — Electrical

101 Park Avenue New York 17, N. Y.

Severud-Elstad-Krueger-Associates

Consulting Engineers

Structural Design - Supervision
Reports - Buildings - Airports
Special Structures
415 Lexington Ave., New York 17, N.Y.

YOU TOO

can use the services of the consulting firms listed on these pages. They represent a great and varied collection of specialized talents.

USE THEM TO

Supply talents and specialties not existing in your organization
Obtain authoritative outside checks on your own findings and conclusions
Provide neutral and impartial opinion when there might be a difference of opinion in your company.
Take full advantage of the progress and mistakes made by others
Ease the present—and continuing—shortage of engineers
Secure secial services that would not warrant full time employment
Do a hundred and one different jobs for you

Singstad & Baillie

Consulting Engineers

Ole Singstad David G. Baillie, Jr.
Tunnels, Subways, Highways
Foundations, Parking Garages

24 State St. New York 4, N. Y.

Frederick Snare Corporation

Engineers—Contractors

Harbor Works, Bridges, Power Plants, Dams, Docks and Terminals.

Difficult and Unusual Foundations A Specialty.

233 Broadway, New York City 7

Havana, Cuba Lima, Peru
Bogota, Columbia, Caracas, Venezuela

Steinman, Boynton, Gronquist & London

Consulting Engineers

HIGHWAYS - BRIDGES - STRUCTURES

117 Liberty St., New York 6, N. Y.

Tippetts-Abbett-McCarthy-Stratton

Engineers and Architects

Ports, Harbors, Flood Control, Power Dams, Bridges, Tunnels, Highways, Railroads, Subways, Airports, Traffic, Foundations, Water Supply, Sewerage, Reports, Design, Supervision, Consultation.

375 Park Avenue, New York 22, N. Y.

Arnold H. Vollmer Associates

Consulting Engineers

Highways, Parks, Bridges, Municipal Improvements, Public Works, Reports, Surveys, Contract Plans.

25 W. 45th Street, New York 36, N. Y.
Telephone: Circle 7-6250

Lawrence S. Waterbury

Consulting Engineer

Bowling Green 9-9298
26 Broadway New York 4

Keis & Holroyd

Consulting Engineers

Formerly Solomon & Keis
Since 1906
Water Supply, Sewage Disposal, Garbage & Refuse Incineration, Industrial buildings.
Troy, N. Y.

Royal Contracting Corp.

MUD-JACKING, DRILLING & GROUTING SPECIALISTS

Box 141, Bridgeport, Pa.
Ph. BRoadway-2-5891

Capitol Engineering Corporation

Consulting Civil Engineers

Dillsburg, Pennsylvania, U.S.A.

Gannett Fleming Corddry & Carpenter, Inc.

ENGINEERS

Dams, Water Works, Sewage, Industrial Wastes & Garbage Disposal, Highways, Bridges & Airports Traffic & Parking — Appraisals, Investigations & Reports,

Harrisburg, Penna.

Branch Offices
Pittsburgh, Pa. Philadelphia, Pa.
Daytona Beach, Fla.

Grof & Myers

Consulting Engineers

Highways — Bridges — Airports
Surveys — Reports — Plans
Construction Supervision

1824 North 4th St. Harrisburg, Pa.

Modjeski and Masters

Consulting Engineers

Bridges and other Structures
Foundations
Highways and Expressways

900 North Sixth St. Harrisburg, Pa.
Philadelphia - Miami - New Orleans

Albright & Friel Inc.

Consulting Engineers

Water, Sewage, Industrial Wastes and Incineration Problems, City Planning Highways, Bridges and Airports, Dams, Flood Control, Industrial Buildings, Investigations, Reports, Appraisals and Rates

3 Penn Center Plaza Phila. 2, Pa.

Fridy, Gauker, Truscott & Fridy, Inc.

Architects & Engineers

Water, Sewer, Waste Disposal, Roads, Airports, Power & Lighting, Petroleum Facilities, Hospitals, Schools, Public & Industrial Buildings, Reports, Plans, Supervision, Appraisals.

1321 Arch St. Philadelphia 7, Pa.

Harris-Dechant Associates

Consulting Engineers

Water Supply, Dams, Stream Improvement, Flood Control, Port & Harbor Development; Sanitary & Industrial Wastes; Hydro & Steam Power; Highway Engineering & Design.

Surveys—Reports—Economics

123 S. Broad St., Philadelphia 9, Pa.

The Kuljian Corporation

Engineers • Constructors

WE DESIGN AND CONSTRUCT

Power Plants • Public Works • Processing Plants • Oil Refineries • Chemical Plants • Textile Plants • Airport Facilities • Military Installations

1200 N. Broad St., Philadelphia 21, Pa.

Justin & Courtney

Consulting Engineers

Joel B. Justin - Neville C. Courtney
Dams and Power Problems, Hydroelectric, River Basin Developments, Water Supply, Foundations.

121 South Broad Street
Philadelphia 7, Pa.

Yule, Sticklen, Jordan & McNee

ENGINEERS

Bridges, Highways, Airports
Design, Investigations, Reports
Supervision of Construction
Civil, Structural Mechanical & Electrical

Cedar Cliff Drive
Camp Hill, Pa.

1225 Vine Street
Philadelphia 7, Pa.

5564 North High Street
Columbus, Ohio

Hunting, Larsen & Dunnells, *Engineers*

Industrial Plants — Warehouses, Office and Commercial Buildings, Steel and Reinforced Concrete. Design and Supervision, Reports.

1150 Century Bldg., Pittsburgh, Pa.

Morris Knowles Inc.

Engineers

Water Supply and Purification Sewerage and Sewage Disposal, Valuations, Laboratory, City Planning.

Pittsburgh, Pa.

Pennsylvania Drilling Company

Subsurface Explorations, Grouting,
Industrial Water Supply,
Mineral Prospecting.
Large Diameter Drilled Shafts, Reports
1205 Chartiers Ave. Pittsburgh 20, Pa.

Michael Baker, Jr., Inc.

Consulting Engineers, Civil Engineers, Planners & Surveyors; Airports & Highway Design; Water Works & Sewerage Design & Operation; Aerial Topo Maps; Surveys; Reports & Investigations; Irrigation, Home Off.—Rochester, Pa. Br. Off.: Jackson Miss.; Harrisburg, Pa.; College Park, Md.

Sprague & Henwood, Inc.

Drilling Services

Foundation Investigations, Soil Testing & Test Borings, Grout Hole Drilling & Pressure Grouting, Diamond Core Drilling

Main Office
221 W Olive Street, Scranton, Pa.

Branches:
1009 Western Savings Fund Bldg., Philadelphia, Pa.
11 W. 42nd St., New York, New York
300 Mt. Lebanon Blvd., Suite 100 Pittsburgh 34, Pa.
Box 1446—Grand Junction, Colorado
Nashville, Tennessee
Tucson, Arizona
Buchans, Newfoundland

Swindell-Dressler Corp.

CONSULTING ENGINEERS

Industrial Plants — Waterworks — Sewer Systems — Highways — Dams — Bridges — Surveys — Reports — Design and Construction Supervision

Box 1888 • Pittsburgh 30, Pa.

Frank D. McEnteer's Associates, Inc.

Consulting Engineers

Bridges, Highways, Industrial Plants
Design, Investigations, Surveys
Terminal Building, Clarksburg, W. Va.

SOUTH

Harry Hendon & Associates, Inc.

Engineers

Civil Engineers—Public Utilities
Investigations—Designs
Supervision of Construction

P. O. Box 7404A 925 Sligh Blvd.
Birmingham 13, Ala. Orlando, Florida

Professional Assistance

in solving your most difficult problems is offered by these consultants.

HOW ABOUT YOU? These consultants are taking full advantage of the opportunity now available to reach over 82,000 prospects and customers every week. You, too, can now receive the benefits of the PROFESSIONAL SERVICES SECTION 52 times in a year.

For further information write:

ENGINEERING NEWS-RECORD
Class. Adv. P.O. Box 12, New York 36

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names — **Additional cards on preceding and following pages**

Palmer and Baker Engineers, Inc.
Consulting Engineers - Architects
Surveys-Reports-Design-Supervision
Consultation
Transportation and Traffic Problems
Tunnels-Bridges-Highways-Airports
Industrial Buildings
Waterfront and Harbor Structures
Graving and Floating Dry Docks
Complete Soils, Materials and Chemical Laboratories
Mobile, Ala. New Orleans, La.
Washington, D. C.

Rader and Associates
Engineers - Architects
Sewage Disposal, Water Works, Ports, Airports, Bridges, Highways, Office and Commercial Buildings, Industrial Plants, Reports, Investigations, Consultations, Aerial Photography, Photogrammetry.
First Natl. Bank Bldg., Miami 32, Fla.

J. Stephen Watkins
Consulting Engineers
Highways—Bridges—Sewerage
Water Supply—Industrial Plants
446 E. High St., Lexington, Kentucky
2617 Dixie Highway, Louisville, Ky.
107 Hale St., Charleston, W. Va.

Eustis Engineering Company
FOUNDATION AND SOIL
MECHANICS INVESTIGATIONS
Soil Borings *Laboratory Test*
Foundation Analyses *Reports*
3635 Airline Highway
Metairie, Louisiana

Schmidt Engineering Co. Inc.
Consulting Engineer
Investigations, Reports, Designs, Supervision Heavy Construction—Dams and Hydroelectric Projects—Foundation Explorations and Treatment—Water and Sewerage Works—Bridge, & Highways
Emerson Building Chattanooga, Tenn.

ETCO Engineers and Associates
Foundation Consultants
Test Borings Laboratory Tests
Recommendations, Design and Supervision
2116 Canada Dry St., Houston 23, Tex.
727 Main St. Baton Rouge, La.
427 Carondelet St., New Orleans 12, La.

MIDDLE WEST

Alvord, Burdick & Howson
CONSULTING ENGINEERS
Water Works Sewerage
Water Purification Sewage Treatment
Flood Relief Power Generation
Drainage Appraisals
20 North Wacker Drive, Chicago

Dames & Moore
Consultants in
Applied Earth Sciences
Soil Mechanics Engineering Geology
Geophysics
Chicago • New York • San Francisco
Los Angeles • Portland • Seattle
Atlanta • Salt Lake City

Professional Assistance

in solving your most difficult problems is offered by consultants whose cards appear in this section.

Consoer, Townsend & Associates
Consulting Engineers
Sewage treatment, sewers, storm drainage, flood control—Water supply and treatment—Highway and bridges—Airports—Urban renewal—Electric and gas transmission lines—Rate studies, surveys and valuations—Industrial and institutional buildings.
360 East Grand Ave. Chicago 11, Ill.

De Leuw, Cather & Company
CONSULTING ENGINEERS
Public Transit Subways
Traffic & Parking Railroad Facilities
Expressways Industrial Plants
Grade Separations Municipal Works
Urban Renewal Port Development
150 North Wacker Drive, Chicago 6
San Francisco New York Boston

The Engineers Collaborative
Consulting Engineers
Structural Drawings & Specifications
Advanced Structural Design & Analysis
Structural Model Analysis
Instrumented Load Tests & Analysis
Deep Excavation & Foundation Design
Seismic Measurement & Analysis
Noise Measurement & Isolation
Blast & Vibration Control
Petrographic & Geological Reports
Investigations & Reports
116 So. Michigan Ave. Chicago 3, Ill.

Erik Floor & Associates, Inc.
Consulting and Design Engineers
Hydroelectric Projects — Dams — Flood Control—Hydraulic Structures—Irrigation — Transmission Lines — Investigations—Reports—Designs
139 N. Clark St. Chicago 2, Ill.

Harza Engineering Co.
Consulting Engineers
Hydroelectric Plants & Dams
Transmission Lines
Flood Control, Irrigation
River Basin Development
100 West Madison Street Chicago 6

Greeley and Hansen
Engineers
Water Supply, Water Purification
Sewerage, Sewage Treatment
Flood Control, Drainage, Refuse Disposal
14 E. Jackson Boulevard
Chicago 4, Illinois

Hazelet & Erdal
CONSULTING ENGINEERS
Fixed & Movable Bridges, Expressways, Industrial Plants, Airports, Dams.
Monadnock Block, Chicago 4, Ill.
Dixie Terminal Bldg., Cincinnati 2, O.
Commerce Bldg., Louisville 2, Ky.
Oding Bldg., Lansing 33, Mich.

Pioneer Service & Engineering Co.
Consulting and Design Engineers
Operations - - - Purchasing
Steam - - Hydraulic - Gas
Public Utilities - - Industrials
231 So. La Salle St. Chicago 4

Sargent & Lundy
ENGINEERS
Consultants to the Power Industry
Studies • Design • Supervision
140 South Dearborn Street,
Chicago 3, Ill.

Suhr, Peterson, Peterson & Suhr
Consulting Engineers
REPORTS—PLANS—SUPERVISION
Sewerage, Water Supply, Flood Control & Drainage, Airports, Roads, Surveys
Fixed & Movable Bridges
130 N. Wells St., Chicago 6, Ill.
P. O. Box 1858, Anchorage, Alaska

Chas. W. Cole & Son
Engineers and Architects
3600 E. Jefferson Blvd.
South Bend, Indiana
2112 W. Jefferson St.
Joliet, Illinois

The Hinchman Corporation
Consulting Engineers
"WORLD-WIDE ACTIVITIES"
Survey • Design • Supervision
Specializing In
Corrosion Control•F.C.C. Certification Tests
Electromagnetic Interference Studies
Francis Palms Bldg., Detroit, Michigan

The H. C. Nutting Company
Testing Engineers—Inspection Service
Foundation Investigation—Test Borings
Soil Mechanics—Sewage Flows
Construction Control—Concrete
Water Waste Survey
4120 Airport Road Cincinnati 26, O.

The Austin Company
Design and Construction
Manufacturing and Process Plants
Newspaper and Broadcasting Bldgs.
Power Plants—Industrial & Institutional
Industrial Office Buildings and Laboratories
Merchandising Bldgs. & Facilities
Plant Location Surveys
New York CLEVELAND Los Angeles
Chicago Houston Oakland
Detroit Seattle

Havens and Emerson
A. A. Burger, H. H. Moseley, J. W. Avery, F. S. Palocsay, E. S. Ordway, A. M. Mock, G. H. Abplanalp, S. H. Sutton
Frank C. Tolles, Consultant
Water, Sewerage, Garbage, Industrial Wastes, Valuation—Laboratories
Leader Bldg. Woolworth Bldg.
Cleveland 14 New York 7

F. H. Maag
Consultant—Construction Accounting
Estimating, Cost Control,
Accounting Methods
Insurance Requirements
13909 Edgewater Drive
Phone—AC-6-3738
Lakewood, 7, Ohio

The Osborn Engineering Co.
DESIGNING-CONSULTING
Industrial Plants Office Buildings
Stadiums Grand Stands Field Houses
Bridges Garages Laboratories
7016 Euclid Ave. Cleveland 3, Ohio

Rackoff Associates
Engineers
Highways, Expressways, Bridges, Sewerage and Water Systems, Fiscal and Master Planning, Investigations, Urban Renewal, Supervision
1033 W. Third Ave., Columbus, Ohio

When you need a SPECIALIST in a hurry . . .

Engineering News-Record's Professional Service Section offers the quickest most direct method of contacting consultants who may be available NOW.

Slocum & Roberts
Construction Consultants
Heavy Construction Project Investigations, Planning, Estimating & Bidding
Plant Layout & Management
504 E. Pine St. 11820 Edgewater Drive
Alhambra, Calif. Lakewood 7, Ohio

Jones, Henry & Williams
Consulting Sanitary Engineers
Water works Sewerage & Treatment
Waste Disposal
2000 W. Central Ave., Toledo 6, Ohio

Toledo Testing Laboratory
Engineers—Chemists
Concrete—Soils—Asphalt
Inspection Research
Tests Development
Foundation Investigation
Borings—Diamond Drilling
Load Tests
Soils Mechanics Laboratory
1810 North 12th St. Toledo 2, Ohio

WEST OF MISSISSIPPI

Heron Engineering Co.
Consulting Engineers
For all types of Aerial Tramways, Cableways, and Suspended Structures
2000 South Acoma St.
Denver 23, Colorado

Stanley Engineering Company *Consulting Engineers*
Hershey Building 208 S. LaSalle St.
Muscatine Ia. Chicago 4, Ill.

Black & Veatch
Consulting Engineers
Water - Electricity - Sewage - Gas - Industry - Reports, Design, Supervision of Construction, Investigations, Valuation and Rates.
1500 Meadow Lake Parkway
Kansas City 14, Missouri

Burns & McDonnell
Engineers—Architects—Consultants
4600 E. 63rd St. Trafficway
Kansas City 41, Missouri

Uri Seiden
Structural Consulting Engineer
Trouble shooting for Contractors. Modification of existing structures and buildings under construction. New designs. Technical arbitration.
Professional Bldg., Kansas City 6, Mo.
VI 2-5336

Russell and Axon
Consulting Engineers
Civil — Sanitary — Structural
Industrial — Electrical
Rate Investigations
408 Olive St. St. Louis 2, Mo.
Municipal Airport, Daytona Beach, Fla.

Sverdrup & Parcel Engineering Co.
Engineers—Architects
Bridges, Structures and Reports, Industrial and Power Plant Engineering
915 Olive St., St. Louis 1, Mo.
417 Montgomery St., San Francisco, Calif.

CHECK
this section whenever you need professional advice.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names

Additional cards on preceding pages

Benham Engineering Company

Established in 1909
Design and Consulting Engineers
215 N E 23rd Street
Oklahoma City 5, Oklahoma

Spencer J. Buchanan and Associates, Inc.

Consulting Engineers
Soil Mechanics and Foundation Engineering. Civil Engineering Services. Reports, Design and Field Supervision.
310 Varisco Building, Bryan, Texas
TAylor 2-3767

Soil Mechanics Incorporated

Foundation Exploration and Testing Services

Site Investigations, Soil Borings, Field and Lab Testing, Load Tests, Reports

310 Varisco Building, Bryan, Texas
TAylor 2-3767

Lockwood, Andrews & Newnam

Consulting Engineers
Navigation Facilities — Public Works
Airports — Earthworks — Roads,
Structural, Mechanical — Electrical
Reports — Design — Supervision
Surveys — Valuations
Corpus Christi—Houston—Victoria, Texas.

FAR WEST

International Engineering Company, Inc.

ENGINEERS
Investigations - Reports - Design
Procurement - Field Engineering
Domestic and Foreign
74 New Montgomery St.
San Francisco 5, California

Fairchild Aerial Surveys, Inc.

36 years experience . . . domestic and foreign operations . . . aerial photography . . . photomapping . . . plainmetric and topographic maps . . . automatic cross-sectioning . . . airborne magnetometer . . . geophysical services . . . gravity meter surveys . . . electronic positioning services.
Los Angeles: 224 E. 11th Street New York: 9 Rockefeller Plaza Chicago: 400 W. Madison Street. Boston: New England Survey Service, Inc., 255 Atlantic Avenue. Birmingham: 2229 1st Ave. N. Denver: 2620 S. Ivy.

Jacobs Associates

Consulting Construction Engineers
TUNNELS—DAMS
EARTHMOVING—FOUNDATIONS
Methods, Cost Estimates, Plant Design, Management, Surveys, Engineering Geology, Materials Handling
503 Market St., San Francisco 5, Calif.

Nevada Testing Laboratories, Ltd.

Engineering—Civil—Soils & Foundation Consultants—Field Testing—Soil Borings — Rock Drilling — Materials Field Control—Load Tests—Laboratory Testing—Soils—Concrete—Asphalt
300 W. Boston Ave. Las Vegas, Nev.

INSPECTION & TEST

Robert W. Hunt Company

Inspection and Testing of Engineering Materials & Equipment

General Offices and Laboratories

810 South Clinton Street, Chicago 7.
All Principal Cities

Johnson Soils Engineering Laboratory

Foundation Design - Highway & Airport Pavements - Construction Control - Load Tests - Shear & Consolidation Tests - MOBILE LABORATORIES
193 West Shore Ave., Bogata, N. J.
Bogata-Hubbard 7-4408

Pittsburgh Testing Laboratory

A national service with complete laboratory and inspection facilities.
Laboratories in principal cities.
Main Office: 1330 Locust St.,
Pittsburgh, Pa.

AERIAL SURVEYS

American Air Surveys, Inc.

AERIAL TOPOGRAPHIC MAPS & AERIAL PHOTOS FOR
• Highways • Airports • Power & Pipe Lines • Railroads • Mining • All types construction • Stockpile Inventories
907 Penn Ave. Pittsburgh 22, Pa.
Branches-Manhasset, N.Y.-Atlanta, Ga.

FIELD SURVEYS

Waterman, Fuge & Assoc.

Surveyors
Completely equipped survey parties for domestic and foreign work. Highways Control for aerial surveys—Municipal, streets, sewers, water lines—Gas and Electric transmission lines—P. O. Box 620, Fort Atkinson, Wisconsin. Telephone JOrdan 3-2469.

ESTIMATING

Estimators Ltd., Inc.

ACCURATE — CONFIDENTIAL
Professional Construction Estimators
Any Project — Anywhere
Main Office:
347 E. Market St., Long Beach 5, Calif
Phones GArfield 3-0084 NEvada 6-5033
or Cable ESTIMINC

GEOLOGISTS

Geologic Associates

ENGINEERING GEOLOGISTS
Studies and Reports
Foundation Investigations
Specialized Drilling and Sampling

Brentwood, Tennessee
Phone (Nashville) VErnon 2-1748

GEOPHYSICISTS

Alpine Geophysical Associates, Inc.

Geophysicists-Engineers-Oceanographers

Land and Marine Foundation Surveys
Highways-Bridges-Tunnels-Buildings-
Consultants-Earthquake-Oceanographic

10 Oak Street
Norwood, New Jersey

2418 Tangley
Houston, Texas

CHECK

this section whenever you need professional advice.

REMEMBER!!

You can depend on these consultants for a fast accurate solution to your problems. Consult them when necessary.

SEARCHLIGHT

Equipment Locating Service

This service is aimed at helping you, the reader of "SEARCHLIGHT", to locate Surplus new and used Engineering and Construction equipment not currently advertised. (This service is for USER-BUYERS only). No charge or obligation.

How to use: Check the dealer ads on pages 92-94 to see if what you want is not currently advertised. If not, send us the specifications of the equipment wanted on the coupon below, or on your own company letterhead to:

Searchlight Equipment Locating Service
Classified Advertising
c/o ENGINEERING NEWS-RECORD
P.O. Box 12, New York 36, New York

Your requirements will be brought promptly to the attention of the equipment dealers advertising in this section. You will receive replies directly from them.

- -

Searchlight Equipment Locating Service
Classified Advertising
c/o ENGINEERING NEWS-RECORD
P.O. Box 12, New York 36, N. Y.

Please help us locate the following equipment:....................................

....

Name .... Title ....

Company .... Street ....

City .... Zone..... State...............................

12/8/60

CLASSIFIED ADVERTISING INDEX

Albert Pipe Supply Co. 94
Associated Pipe & Fitting Co. 94
Atkinson Co., Guy F. 94

Benson-Stead Co. 94
Blount Brothers Construction Co. 91
Buff 93

Capitol Crane Corp. 93
Case Construction Corp. 92
Conmaco Inc. 94
Coon Certified Concrete Inc. 93

Davidson Pipe Supply Co. Inc. 94

Equipment Corporation of America.......93

Forsythe Equipment Co. 93
Foster Co., L. B. 94

Gillis & Co. 94
Greenpoint Pipe Supply Corp. 94

Harza Engineering Co. 91
Hodge & Hammond Inc. 94

Lipsett Inc. 92

Memphis Equipment Co. 94
Miami Dept. of Water and Sewers, City of 91
Midwest Steel Co. 94
Mississippi Valley Equipment Co. 94

National Blue Print Co. 93
National Schools of Construction.......92

Parke Davis & Co. 91

Seaboard Equipment Co. Inc. 93

Telephone Engineering Co. 93
Thompson Inc., Harry A. 92
Trinity Dam Contractors.................93

Warren-Knight Co. 93
Western Services Corp. 94
Whisler Equipment Co. 93
Whisler Steel Piling Co. 94
Wilson Engineering Corp. 92

ADVERTISERS IN THIS ISSUE

Allis-Chalmers 80-81
Alpha Portland Cement Company 89
American Bridge Div., United States Steel Corp. 82
American Vitrified Products Company 5
Armco Drainage & Metal Products, Inc...40-41
Asphalt Institute, Inc..................... 6-7

Bethlehem Steeel Co.....................54-55

Caterpillar Tractor Co..................... 85
Chicago Pneumatic Tool Company, Reichdrill Div. 4
Concrete Reinforcing Steel Institute...... 64

John Deere Industrial Div................ 13
The Dow Chemical Company............. 46
Richard Dudgeon Inc..................... 64

Elgood Concrete Forms, Corp............ 64
Euclid Div., General Motors Corp........44-45

General American Helicopters, Inc....... 59
The Goodyear Tire & Rubber Co., Industrial Products Co........................ 1
Griffin Wellpoint Corp.................... 18

Harbert Construction Corp................ 48
Heppenstall Company 60
The Frank G. Hough Co................... 8
Hyster Company 29

International Business Machines Corp...... 27
Iowa Manufacturing Co..................76-77

Jenkins Bros. 16

Kaiser Aluminum & Chemical Corp.....34-35
Keuffel & Esser Co......................57; 65
Koehring Division 73

The Master Builders Company........3rd Cov.
W. R. Meadows, Inc 39
Mississippi Valley Structural Steel Co.... 49
Moretrench Corporation 60

National Tube Div., U. S. Steel Corp....14-15
Northwest Engineering Co................. 3

Ozalid Div., General Aniline & Film Corp. 37

Pittsburgh-Des Moines Steel Company..2nd Cov.
Portland Cement Association.............50-51
Posey Iron Works, Inc.....................59
Presstite Division, American Marietta Company 12

John A. Roebling's Sons Division, The Colorado Fuel and Iron Corporation.... 58
Rollway Bearing Co., Inc................. 52
Russell, Burdsall & Ward Bolt & Nut Co. 61

Silent Glow Oil Burner Corporation...... 71
Spencer, White & Prentis, Inc............ 66
John W. Stang Corp...................... 48
Symons Clamp & Mfg. Co.................. 2

Texaco Inc., Asphalt Sales Div......4th Cov.
Thompson Pipe and Steel Company........ 65
The Timken Roller Bearing Co........... 20

U. S. Steel Corp............9-11; 62-63; 69

Professional Services 95-98

CLASSIFIED ADVERTISING

F. J. Eberle, Business Mgr.

Employment Opportunities 91-92
Notices
Proposals 88-90
Equipment
(Used or Surplus)
(For Rent, Sales Wanted).....92-94
Advertisers' Index 98

ENGINEERING NEWS-RECORD

330 West 42 St., New York 36—LOngacre 4-3000

ABP Member ABC

Number of copies of this issue printed 86,759

D. S. ROBERTSON, Advertising Sales Manager
HUGH J. CARLSON, Assistant Business Manager

ADVERTISING REPRESENTATIVES

Atlanta, 9—1375 Peachtree St., N.E.,
Robert H. Powell, Jr.

Boston, 16—McGraw-Hill Bldg., Copley Square
C. D. Neulen

Chicago, 11—520 No. Michigan Ave.
L. H. Hunt, W. G. Payne, Earl S. Moore, Jr.

Cleveland, 13—1164 Illuminating Bldg.,
55 Public Square
H. A. Bergstrom, F. P. DiToro

Dallas, 1—Vaughn Bldg., 1712 Commerce St.,
John Grant, Robert T. Wood

Denver, 2—Tower Building, 1700 Broadway
J. W. Patten

Detroit, 26—856 Penobscot Bldg.
R. I. Mace

Los Angeles, 17—1125 W. Sixth St.,
Knox Bourne, S. S. Tiebout

New York, 36—500 5th Ave.
C. D. Neulen, H. T. Olsen
Robert L. Barker

Philadelphia, 3—Six Penn Center Plaza
D. G. Jensen
Patrick Keleher

Pittsburgh, 22—4 Gateway Center
Malcolm Russell

Portland 4, Oregon—Room 445, Pacific Bldg.
Scott Hubbard

St. Louis, 8—Continental Bldg., 3615 Olive St.
E. B. Mingle, Jr.

San Francisco, 4—68 Post St.
John J. Hernan

OTHER SALES OFFICES:

United Kingdom, Edwin E. Murphy, 95 Farringdon St., London E.C. 4.—Germany, Austria, Stan Kimes, 85 Westendstrasse, Frankfort/Main, Germany—Switzerland, Italy, France and Belgium, Michael R. Zeynel, 2 Place du Port, Geneva, Switzerland

---

ADVANCE CONSTRUCTION BUSINESS NEWS

For the
- **EXECUTIVE**
- **CONTRACTOR**
- **SALES MANAGER**
- **COST ESTIMATOR**

CONSTRUCTION DAILY—

A Complete Construction Business News Service:

For $225 per year (less than $1 per day) you get 253 NEWSLETTERS with proposed projects reports, current news and the special features below and 253 sets of REPORTS on bid dates, low bidders and contracts. These come to you by first class mail.

New proposed projects reported in the NEWSLETTER total over $21 billion per year in *future* buying power, new construction and building contracts in REPORTS total over $22 billion per year in *immediate* buying power.

Regular Special Features

EACH WEEK—Two special price & cost trend reports

Contract Awards by type of construction for week & cumulative

New construction Financing:

EACH MONTH—Special reports include: Construction Contracts, Backlog of Construction Projects in the planning stage, in each of 50 states analyzed for 9 classes of construction.

A 3-month test offer

You can test the special benefits to you for three months at the quarterly rate of $65.

A bonus for starting now:

You get a two weeks (ten-day) service at no additional cost by entering your 3-months subscription this month.

Go after a big share of this construction volume—start your CONSTRUCTION DAILY Service NOW:

CONSTRUCTION DAILY
A McGraw-Hill Service
28th Floor—330 West 42nd St.,
New York 36, N. Y.

O.K.—Enter a three-month trial subscription to CONSTRUCTION DAILY at a cost of only $65.00 (this offer includes free copies for an additional 10 days). This offer covers daily copies of both the CONSTRUCTION REPORTS and NEWSLETTER—sent by 1st class mail. Or, if you prefer a year at $225 check here ☐

☐ Payment enclosed

Name .... Position........
Address ....
City........... Postal Zone...... State......
Name of Company.......................
Type of Business.......................

ENR—T1/3

Editorials

Urban Headaches

The exploding metropolis has had plenty of attention of late. In recent weeks at least three major books on urban problems have appeared: "The Squeeze" by Edward Higbee (Morrow), "Metropolis 1985" by Raymond Vernon (Harvard University Press), and "The Human Side of Urban Renewal" by Martin Millspaugh and Furney Breckenfeld (Washburn). CBS Television has produced a program called "Big City—1890." The American Municipal Association has met and called anew for more federal help with its members' problems (p. 78). Meanwhile, the Pedestrian League of America has stepped up its campaign against automobiles in the city.

Most of the prognostications for future urbia are pessimistic: "Cheer up, the worst is yet to come!" they seem to say. By 1985 U.S. population is expected to increase by more than 100 million over its present 180 million. The newcomers will cluster even more densely around our urban centers than does our present population. As commuter railroads and mass transit founder, the ever-growing hordes of commuting automobiles may yet create the ultimate, irresolvable traffic jam. Meanwhile, slums proliferate while commerce and industry decline in the big cities at great loss in tax revenue. And as tax revenues decline, the need for municipal services rises.

We choose optimism. The city is here to stay, and it will stay alive by rebuilding. Many cities have learned that they pay for procrastination in urban renewal at a high rate of compound interest. They are discovering that they can't afford not to rebuild. For redevelopment can raise the tax base of a blighted district from five to 10 times its original assessment. Moreover, urban slums and outworn municipal services can be financial burdens. A slum district seldom, if ever, pays its way; it is inevitably subsidized from the more prosperous sections of the city. More and more cities are learning this and doing something about it.

The chief obstacle to solving the cities' problems, as Dean John E. Burchard of MIT indicated in his TV appearance on "Big City—1980," is neither technological nor financial. It is human inertia. What distinguishes the cities that are vigorously attacking their problems from their apathetic counterparts is public, civic and business leadership. ENR's prize winning report on Pittsburgh and our more recent study of Philadelphia have proven that. The public responds to policies such as Philadelphia's expanding program of subsidized rail commuter service (ENR Oct. 13, p. 41). A whole city can respond to the contagion of civic pride once the leaders have incubated and passed the germ, as in Pittsburgh (ENR Nov. 19, 1959, p. 55).

Creation of a Department of Urban Affairs, anticipated under the Kennedy Administration, may provide leadership at the federal level as a substitute for leadership at the municipal level, where it should be, but where it is still lacking in too many places. Wherever the necessary leadership's source—in city hall, in business, in civic groups, in the White House—we need it, among private interests as well as throughout the body politic, for the solution of municipal problems. With leadership, we can confound the pessimists who predict we shall remain a step or two behind the cure of our most critical urban headaches throughout the foreseeable future.

Cost Reduction

An intriguing question was asked by one of the speakers at the 1960 Fall Conference of the Building Research Institute: Why can't the techniques that have proved successful in lowering costs of manufacturing operations be applied to construction?

The speaker was R. J. Short, director, Engineering Exploration, The Proctor & Gamble Co., Cincinnati. He pointed out that building costs have been rising much more rapidly than those for factory products (ENR Nov. 24, p. 23). He then compared what manufacturing industries have done to cut costs with the efforts of the construction industry. He concluded that construction is loaded with cost-reduction possibilities, but too many of them are missed.

One reason for the relatively slow progress of the construction industry is lack of sufficient long-range research. Another is insufficient on-site study of better methods.

Manufacturers use specialists, industrial engineers, who search out and develop better, cheaper methods for getting a job done. "Why not use their talents in construction?" Mr. Short asks. His company has tested this concept in both design and construction, by transferring some of its industrial engineers to the problem of construction-cost reduction. Results to date, Mr. Short says, have thoroughly established the conviction that this approach is just as correct for construction as it is for manufacturing.

It is easy to think up excuses for not using the industrial engineering approach. The techniques have not been tried in construction; construction is different from manufacturing industries; even if new techniques were developed, the unions won't let us use them. The truth of the matter is that too few construction managers or designers have considered sponsoring long-range research into cost reduction or the use of industrial engineering principles.

If the technique works for Proctor & Gamble both in the factory and in building design and construction, it should work for others. Construction costs cannot be allowed to continue to rise unabated. Rising costs must be fought with every means at our disposal. Long-range research is one way; the industrial engineering approach is another.

As in Dallas today . . .

Where there's progress . . . there's POZZOLITH concrete

The men who designed and built these outstanding, modern structures specified and used POZZOLITH to assure concrete of superior architectural and structural quality at lowest possible cost.

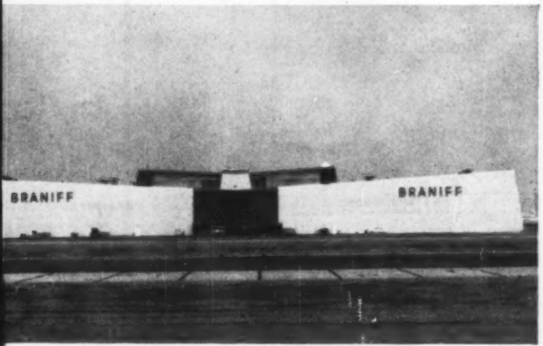
Over the years—in cities throughout the world—where careful attention is given to concrete performance and economies, the use of POZZOLITH is increasing steadily. Over 200 million cubic yards of POZZOLITH concrete have been placed to date . . . a significant proof-of-performance record.

For *your* job . . . with *your* materials—POZZOLITH concrete is best. Neither plain concrete nor concrete with any other admixture can match the results you'll get with POZZOLITH.

On current or future concrete projects, the local Master Builders field man will welcome discussing your requirements. Call him in. He's at your service—backed by the Master Builders research and engineering staff—unexcelled in the field of concrete technology. Write us for full information.

The Master Builders Company
Division of American-Marietta Company
Cleveland 18, Ohio
World-wide manufacturing and service facilities

APARTMENT, 3525 TURTLE CREEK • Architect: Howard R. Meyer • Structural Engineer: Frank W. Chappell • General Contractor: Dicker & Frank & Associates • POZZOLITH Ready-Mixed Concrete: Vilbig Concrete Co.



BRANIFF INTERNATIONAL AIRWAYS HANGAR • Architect-Engineer: Pereira & Luckman of Los Angeles • Associate Architect: Mark Lemmon • General Contractor: J. W. Bateson Co., Inc. • POZZOLITH Ready-Mixed Concrete: Wamix, Inc.

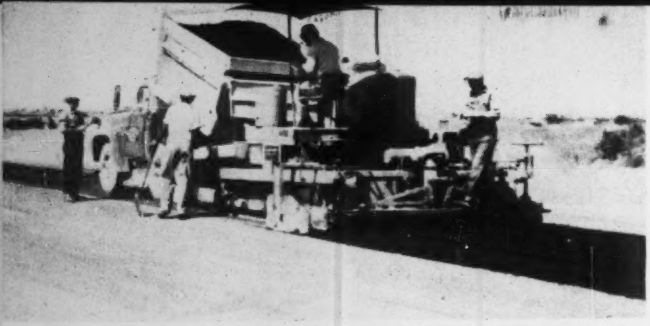
MERCANTILE-CONTINENTAL BUILDING ADDITION • Owner: Mercantile National Bank • Architect: Broad & Nelson • Structural Engineer: R.L.Rolfe • General Contractor: Robert E. McKee General Contractor, Inc.

METHODIST HOSPITAL ADDITION • Architect-Engineer: George L. Dahl Architects & Engineers • General Contractor: T. C. Bateson Construction Company • POZZOLITH Ready-Mixed Concrete: Vilbig Concrete Company.

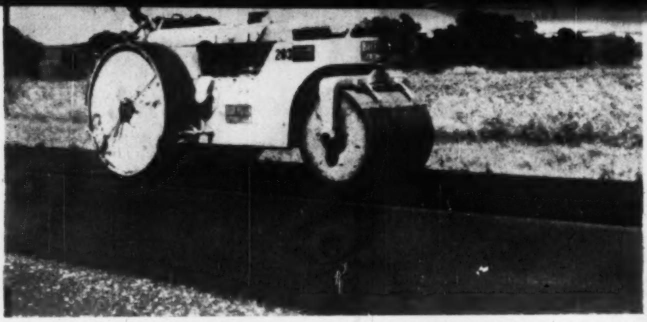
Our 50th Year

MASTER BUILDERS®
POZZOLITH*

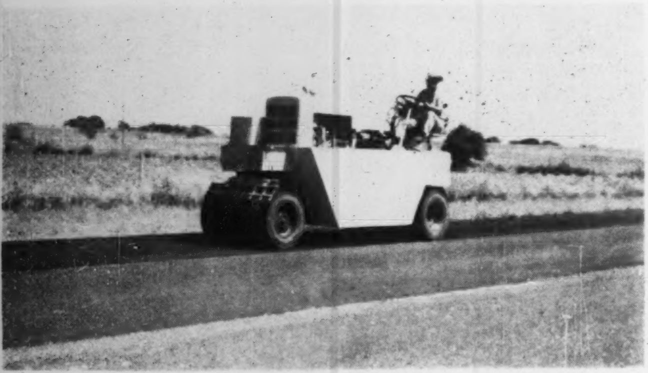
**POZZOLITH is a registered trademark of The Master Builders Co. for its ingredient for concrete which provides maximum water reduction, controls rate of hardening and increases durability.*



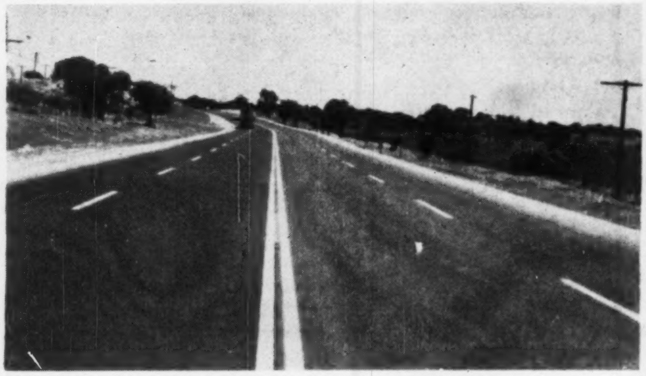
Laying 3½ inch leveling course of plant-mixed Texaco Asphaltic Concrete over old pavement on US 81 in Texas.



A 10 ton three-wheel roller was used for the initial compaction of both the asphalt leveling course and asphalt surface.



This 10 ton pneumatic tired roller gave final compaction to the two asphalt courses.



New Texaco Asphaltic Concrete overlay on US 81 substantially strengthened this highway at moderate cost.

How Texas strengthened old highway at moderate cost with Asphalt overlay

Traffic on US Route 81 north of Georgetown, Texas, has increased to 5,100 vehicles a day—too heavy a load for the highway's old, rough pavement. The method the state used to solve this problem combined speed with economy.

First, a leveling course of plant-mixed Texaco Asphaltic Concrete was laid over the old pavement to an average thickness of 3½ inches. Aggregate used in this course passed a 2½ inch screen. This was topped by a one inch wearing surface of Texaco Asphaltic Concrete, using an aggregate passing a ⅝ inch screen. The crushed limestone and field sand, which were blended with the asphalt, provided a high-stability mix for this overlay.

Since it is resilient, a plant-mixed Texaco Asphaltic Concrete pavement such as Texas laid on US 81, will absorb and weather heavy impact year in and year out. Also contributing to this pavement's durability and low upkeep cost are its immunity to salts, which are used in northern areas of the United States to melt ice and snow, and its freedom from expansion joints which eventually lose their alignment. Besides the heavy-duty Texaco Asphaltic Concrete pavement pictured here, there are several other plant-mixed types of Texaco Asphalt construction for highways, streets, airports and parking areas. These types, which vary in durability and cost, include one which will fit your paving requirements exactly. If you would like helpful information on the methods and materials recommended for all of these pavement types, mail the coupon below. No obligation.

Contractor: GAYLORD CONSTRUCTION COMPANY, Houston

Division Offices: **TEXACO INC., Asphalt Sales Div., 135 E. 42nd Street, New York 17, N. Y.**
Chestnut Hill 67, Mass. • Chicago 4 • Denver 1 • Houston 1
Jacksonville 1 • Minneapolis 3 • Philadelphia 2 • Richmond 25

TEXACO

TEXACO ASPHALT

Please send me your two brochures containing helpful information on heavy-duty, intermediate and low-cost types of asphalt construction for highways, streets, airports, etc.

Texaco Inc., Asphalt Sales, 135 East 42nd Street, New York 17, N. Y.

Name .... **Position** ....

Associated with ....

Address ....